

SUBJECT INDEX

- A**
- A-kinase anchoring protein (AKAP)
regulation of PKA by, 236-37
- A-kinase anchoring protein (AKAP) mediated signal transduction, 235-57
coordination of multivalent signaling complexes by A-kinase anchoring protein (AKAP), 238
cyclic AMP-dependent protein kinase, 236
evolution of A-kinase anchoring proteins (AKAPs), 237-38
muscle A-kinase anchoring proteins (mAKAPs), 238-48
regulation of PKA by A-kinase anchoring protein (AKAP), 236-37
- A1298C polymorphism, 190
- Abbott Laboratories, 388
- Absorption
of tea catechins, 29-30
- (2-Acetoxyphenyl)
heptynysulfide (APHS), 63
- Acids
See Arachidonic acid; Bile acids; Cellular retinoic acid binding protein; Chenodeoxycholic acid; Fatty acids; Lithocholic acid; Retinoic acid receptors; Taurochenodeoxycholic acid; Valproic acid
- Activating PXR
xenobiotics for, 6-7
- Activation of MAP kinase cascades by integrins
direct, 289-91
- Active site signature motif, 210
- ADAPT II software, 120
- Adenine nucleotide translocator (ANT), 266
- Adenomatous polyposis coli (APC), 61, 299
- Adenosine triphosphate (ATP), 325-28
structural studies of, 327-28
- Adhesion receptor families, 284-88
and associated cytoskeletal components, 285
cadherins, 286
Ig CAMs superfamily, 287
integrins, 284-86
selectins, 287-88
- Adverse Drug Reaction Terminology, 122
- Aequorea Victoria*, 411
- Affinity labeling, 438-39
- Agronomic benefits
from genetically modified foods, 100
- AIF
See Apoptic-inducing factor
- Airway hyperresponsiveness (AHR), 82, 84-87
- AKAP 350/450/CG-NAP
coordinated signaling complexes, 246-47
YOTIAO, 244-46
- AKAP220, 242-43
R11 binding enhancing PPI inhibition by, 245
signaling complexes, 244
- Alb-PXR
See Wild-type human PXR
- Allergenicity assessment, 109-10
- Allergens
sequence homology to known, 104-5
- Allergy & Immunology Institute, 102
- Altered DNA methylation, 501-25
carcinogenesis as a multistage, multistep process, 502-3
cell proliferation and carcinogenesis, 512-14
DNA methylation and carcinogenesis, 505-9
importance of epigenetic mechanisms, 503-5
and imprinting, 510-12
interrelationships between mutagenesis, genome stability, 509-10
as a secondary mechanism underlying carcinogenesis, 515-18
significance of secondary mechanism concept, 501-2
- Altered DNA methylation as a secondary mechanism underlying carcinogenesis, 515-18
heritable, aberrant patterns of methylation, 517
normal patterns of methylation, 517
- Aminergic G protein

- aminergic GPCR structure and molecular modeling, 450-54
 binding site of, 437-67
 general indexing method for residue numbering, 438
 methods to identify binding site residues, 438-50
 second extracellular loop, 454-57
 Aminergic GPCR structure and molecular modeling, 450-54
 binding site, 451-52
 receptor activation, 454
 structural bases of pharmacological specificity, 452-54
 Amines
 biogenic, 2
Amycolatopsis orientalis, 381
 Amyl nitrate, 585
 Angiogenesis
 inhibition of invasiveness and, 45
 Animal models, 107-8
 Animal studies, 170-71
 ANT
 See Adenine nucleotide translocator
 Anti-IL-1, 87
 Anti-IL-4, 85-86
 Anti-IL-5, 82-85
 Anti-IL-9, 87
 Anti-IL-13, 86-87
 Anti-inflammatory cytokines, 88-90
 IL-10, 88-89
 IL-12, 89-90
 IL-18, 89-90
 interferons, 89
 Anti-TNF, 87
 Anticancer activities
 mechanisms of, 42-46
 studies in cell lines, 42-45
 Antifungal drugs, 4
 Antihyperalgesic vs. analgesic actions of NSAIDs, 554
 Antioxidative properties of tea polyphenols, 28-29
 AP-1 and related activities
 inhibition of, 43
 APC
 See Adenomatous polyposis coli
 APHS
 See (2-Acetoxyphenyl) heptynylsulfide (APHS)
Aplysia californica, 143
 Apoptic-inducing factor (AIF), 266
 Apoptosis
 inhibition of, 43-44
Arabidopsis thaliana, 528
 Arachidonic acid
 conversion to PGH₂, 57
Aspergillus, 328
 Aspirin, 63
 Assessment of allergenicity of foods produced through agricultural biotechnology, 101-9
 animal models, 107-8
 FAO/WHO decision tree approach to, 103
 level of expression of the novel protein, 109
 resistance to pepsin, 107
 sequence homology to known allergens, 104-5
 source of the novel gene, 102-4
 specific serum screening, 105-6
 targeted serum screening, 106-7
 Asthma therapies, 81-98
 anti-inflammatory cytokines, 88-90
 chemokine inhibitors, 82, 90-92
 inhibition of
 proinflammatory cytokines, 87
 inhibition of T helper 2 (Th2) cytokines, 82-87
 other approaches to cytokine inhibition, 92-93
 strategies for inhibiting cytokines, 81-83
 ATP
 See Adenosine triphosphate
Autographa californica, 263
B
 Backphosphorylation, 242
 Bacterial ligases
 production of D-ala-D-X dipeptides by, 389
 Bactericidal effect of vancomycin on Gram-positive bacteria, 384
 Baculoviral IAP repeat (BIR) domains, 261-62
 Basic fibroblast growth factor (BFGF), 198
 Bcl-2 family members, 265-68
 Bcl-2 homology (BH) domains, 264
 BEL
 See Bromoenol lactone
 Benzo[a]pyrene (BP), 33
 Betamethasone, 3
 BFGF
 See Basic fibroblast growth factor
 BH
 See Bcl-2 homology domains
 Bidentate inhibitors, 223
 Bile acids, 2-3
 binding and activating PXR, 12
 "Bin size," 128
 Binding mode, 476-88

- of chemokine receptors, 479–82
- of chemokines, 476–88
- of hymenialdisine, 346
- of indirubin monooxime, 331
- of inhibitors, 344
- of purvalanol, 337
- of PXR, with xenobiotics, 6–7
- Binding site residues**
 - affinity labeling, 438–39
 - effects of mutations on receptor isomerization, 446–47
 - identification of direct ligand contacts, 447–48
 - implicated in ligand binding, representative, 443–45
 - mapping the surface of the binding-site crevice with the substituted-cysteine accessibility method, 449–50
 - methods to identify, 438–50
 - second-site revertant mutations, 448–49
 - site-directed mutagenesis, 439–48
 - in the transmembrane domain implicated in ligand binding, 440–42
- Binding sites, 437–67**
 - aminergic GPCR structure and molecular modeling, 450–54
 - on the cytoplasmic domain of NHE1, 536
 - general indexing method for residue numbering, 438
 - methods to identify binding site residues, 438–50
 - second extracellular loop, 454–57
- Bioavailability and pharmacokinetics, 29–32**
 - absorption and biotransformation of tea catechins, 29–30
 - pharmacokinetics of tea polyphenols, 30–32
- Biochemical information**
 - processing by ERK, 152–54
 - blockade of ERK activation as a synaptic lock, 154
 - ERK as a biochemical information storage mechanism, 154
 - ERK as a biochemical switch, 153
 - ERK as a coincidence detector, 153–54
 - ERK as a temporal integrator, 154
- Biochemistry and physiology**
 - of S-nitrosothiols, 585–600
 - chemistry, 586–87
 - S-nitrosothiols, nitric oxide and the blood stream, 592–95
 - S-nitrosothiols and signal transduction, 590–92
 - S-nitrosothiols as modulators of enzyme activity, 589–90
 - stability and biological chemistry, 587–89
- Biogenic amines, 2**
- Biology of the spinal cascade**
 - induced by tissue injury, 554–56
 - circulating factors, 556
 - dorsal horn at level of the primary afferent synapse, 555
 - neural linkages, 556
- Bioluminescence resonance energy transfer (BRET), 411–12**
- Biomedical informatics and pharmacogenomics**
 - approaches to pharmacogenomics, 115–16
 - biomedical informatics defined, 113–14
 - challenges for, 113–33
 - comparing genomes to develop pharmacogenomic models, 126
 - data exchange standards, 122
 - developing communication standards in pharmacogenomics, 121–22
 - integrating data from diverse and heterogeneous databases, 123
 - managing laboratory information data, 126–27
 - mining published literature for pharmacogenomic data, 123–24
 - pharmacogenetics and pharmacogenomics defined, 115
 - phenotype-to-genotype approaches, 116–17
 - protecting confidentiality and privacy of clinical phenotype data, 127–28
 - representing the diversity of pharmacogenomic data, 118–20
 - understanding structural consequences of genetic variations, 125–26
 - using expression data to assess the phenotypes of drug response, 124–25
- Biomedical informatics**
 - defined, 113–14
- BIOML, 118**
- Biotransformation**

- of tea catechins, 29–30
- Biphenyls
 - polychlorinated, 4
- BIR
 - See Baculoviral IAP repeat domains
- Birth defects
 - environmentally induced, 181–208
- Bis-aryldifluorophosphonate inhibitors, 222
- Black tea polyphenols (BTP), 32, 39
- Bladder carcinogenesis
 - protection against, 40
- Blockades
 - of COX isozyme expression, 563
 - of ERK activation as a synaptic lock, 154
- BOP
 - See *N*-Nitroso-bis (2-oxopropyl)amine
- BP
 - See Benzo[a]pyrene
- Brain-derived neurotrophic factor (*bdnf*), 198–99
- Brazil nuts
 - allergenicity of, 109–10
- Bromoenoal lactone (BEL), 558
- BTP
 - See Black tea polyphenols (BTP)
 - N*-Butyl-*N*-(4-hydroxybutyl)nitrosamine, 41
- Butyrolactone, 328
- C**
- Cadherins, 286
 - regulating signaling in the WNT pathway, 301
- Cadherins/ β -catenin signaling by, 299–303
- Caenorhabditis elegans*, 237, 259–62, 264, 528
- Calmodulin, 537
- Cambridge Crystallographic Database, 119
- Camellia sinensis*, 26
- cAMP response element binding protein (CREB)
 - regulation of phosphorylation in the hippocampus, 150–51
 - transcription factor, 148–49
- CAMS
 - See Constitutively active mutants
- Canola
 - genetically modified, 100
- Carcinogenesis
 - decreased availability of methyl groups causing liver tumors in rodents, 508
 - DNA methylation and, 506–9
 - hypermethylation, 508–9
 - hypomethylation, 506–8
 - inhibition of, possible mechanisms for, 45–46
 - maintenance of DNA methylation, 507
 - as a multistage, multistep process, 502–3
 - possible epigenetic basis for initiation of, 504–5
 - possible inverse relationship between susceptibility to carcinogenesis and capacity of maintaining normal patterns of DNA methylation, 509
 - susceptibility to, 509
- Carcinogenesis inhibition by tea, 25–54
 - antioxidative properties of tea polyphenols, 28–29
 - bioavailability and pharmacokinetics, 29–32
 - epidemiological studies on tea and cancer, 41–42
 - inhibition of tumorigenesis in animal models, 32–41
 - mechanisms of anticancer activities, 42–46
 - tea chemistry, 26–28
- Carcinogenesis secondary mechanism, 501–25
 - altered DNA methylation as, 515–18
 - carcinogenesis as a multistage, multistep process, 502–3
 - cell proliferation and carcinogenesis, 512–14
 - DNA methylation, 505–6
 - DNA methylation and carcinogenesis, 506–9
 - importance of epigenetic mechanisms, 503–5
 - imprinting, 510–12
 - interrelationships between mutagenesis, genome stability, and altered DNA methylation, 509–10
 - significance of secondary mechanism concept, 501–2
- Caspase recruitment domain (CARD), 261–62
- Caspases
 - FLICE-inhibitory protein, 263–64
 - inhibition of apoptosis at the level of, 261–64
 - inhibitors of apoptosis proteins family members, 261–62
- Catechin gallate, 26, 44
- CBS
 - See Cystathionine B-synthase
- CCR2 inhibitors, 91
- CCR3 inhibitors, 90–91
- CCR4 inhibitors, 92
- Cdc25 inhibitors, 226–27
 - structures of

- small-molecule Cdc25 inhibitors, 227
- Cdks
development of inhibitors, 328–46
inhibition by quinazoline compounds, 344
structural studies of, 327–28
- Celecoxib, 66–67, 69
metabolism of, in humans, 67
- Celera browser, 118
- Cell-cell adhesion receptors
regulation of signaling cascades by, 299–305
- Cell-cycle regulation
modulation of, 44
- Cell death program
activation of, 272
- Cell line studies, 42–45
inhibition of apoptosis, 43–44
inhibition of invasiveness and angiogenesis, 45
inhibition of MAP-kinases, AP-1, and related activities, 43
inhibition of NF κ B and related activities, 43
interference on receptor binding and related activities, 44–45
modulation of cell-cycle regulation, 44
- Cell proliferation
and carcinogenesis, 512–14
effect of NHE1 activity on, 541
multiple factors controlling DNA methylation, 514
in multistage carcinogenesis, 504
varied roles alterations in DNA methylation play in carcinogenesis, 513–14
- Cell Signaling Network
Database, 119, 126
- Cell survival and apoptosis, 540–42
- Cellular actions of NHE1, 538–43
cell survival and apoptosis, 540–42
cytoskeletal organization and migration, 542–43
effect of NHE1 activity on cell proliferation, 541
proliferation, 539–40
- Cellular mechanisms for the repression of apoptosis, 259–81
at the level of caspases, 261–64
at the level of the mitochondria, 264–68
at the level of the plasma membrane, 268–72
- Cellular pharmacogenomic data, 119
- Cellular retinoic acid binding protein (CRABP), 195
- Cellular retinol binding protein (CRBP), 194–95
- Central nervous system (CNS)
actions of COX inhibitors in man, 568–69
COX isozyme inhibition in human pain states, 569
and noninflammatory-induced experimental pain, 568–69
postmitotic neurons of, 143
spinal drug delivery, 569
- CHARMM, 450
- Chelators, 587
- Chemokine inhibitors, 82, 90–92
CCR2 inhibitors, 91
CCR3 inhibitors, 90–91
CCR4 inhibitors, 92
- Chemokine receptors, 479–82
small-molecule antagonists of, 484–88
- Chemokines, 477–79
with known three-dimensional structures and their receptors, 473–74
- Chemoprevention of intestinal tumors by aspirin and other NSAIDs
inhibition of cyclooxygenases, 67–70
mechanisms for, 67–70
- Chenodeoxycholic acid, 12
- Chloroeremomycin, 384
- Cholestasis
potential utility of PXR in treatment of, 12–13
- Cholesterol 7 α -hydroxylase (Cyp7a1), 11
- Ciliary neurotrophic factor (*cntf*), 198
- Circulating factors, 556
- Cisplatin, 33
- Cleft lip/palate (CL/P), 191–72
- Clinical importance of research, 569–70
- Clinical interventions, 171–72
- Clinical pharmacogenomic data, 120
- Clostridia*, 381
- Clotrimazole, 4
- CNS
See Central nervous system
- Co-immunoprecipitation as a tool to determine homo- and heterodimerization, 410–11
- Colon cancer prevention
COX-2 as target for, 55–80
COX-2 inhibitors in the clinic, 66–67

- COX-independent mechanisms, 70-71
 COX inhibition, 62-63
 development of COX-2 inhibitors, 63-66
 discovery of COX-2, 61-62
 kinetics of COX-2 inhibition, 66
 mechanisms for chemoprevention of intestinal tumors by aspirin and other NSAIDs, 67-70
 metabolism of celecoxib in humans, 67
 metabolism of refecoxib in humans, 68
 naturally occurring salicylates, 56
 nonsteroidal anti-inflammatory drugs (NSAIDs) and colorectal cancer, 59-60
 nonsteroidal anti-inflammatory drugs (NSAIDs) and cyclooxygenase, 56-59
 nonsteroidal anti-inflammatory drugs (NSAIDs) use and reduction of adenoma size and number in familial adenomatous polyposis (FAP), 60-61
 risks of chronic NSAID therapy for cancer prevention, 71-72
 structure of COX inhibitors, 65
 structure of NSAIDs and related compounds, 64
 worldwide sales of NSAIDs and COX-2 inhibitors, 69
 Colorectal cancer epidemiological studies relating aspirin intake to reduced mortality from colon cancer, 60 and NSAIDs, 59-60
 risk reduction in human sporadic colorectal carcinoma, 59-60
 Combinatorial synthesis of 2,6,9-trisubstituted purines, 336
 Communication standards in pharmacogenomics drug and compound names, 121-22
 human gene names and links to other organisms, 121
 side effects, 122
 COMPARE analysis, 334, 340
 Comparing genomes to develop pharmacogenomic models, 126
 Conditioning Pavlovian, 137
 Confidentiality of clinical phenotype data protecting, 127-28
 Congenital anomalies defined, 183-84
 CONSAM software, 120
 Constitutive dimerization effect of agonist on the dimers detection, 416-18 vs. ligand-promoted, 414-19
 Constitutive location of spinal COX isozymes, 558-59
 Constitutive spinal localization of PLA2 isozymes, 557
 Constitutively active mutants (CAMs), 446
 Conversion of arachidonic acid to PGH2 by combined action of cyclooxygenase and peroxidase activities of COX, 57
 Coordination of multivalent signaling complexes by A-kinase anchoring protein (AKAP), 238
 Corn insect-resistant, 99-100
 Correlation between effect of mutagenesis and PTPs, 213-14
 Cortical atrophy, 172-73
 Corticosteroids, 92
 Corticosterone, 6
 COSTART, 122
 Cotton genetically modified, 100
 COX-2 as target for colon cancer prevention, 55-80
 COX-2 inhibitors in the clinic, 66-67
 COX-independent mechanisms, 70-71
 COX inhibition, 62-63
 development of COX-2 inhibitors, 63-66
 discovery of COX-2, 61-62
 kinetics of COX-2 inhibition, 66
 mechanisms for chemoprevention of intestinal tumors by aspirin and other NSAIDs, 67-70
 metabolism of celecoxib in humans, 67
 metabolism of refecoxib in humans, 68
 naturally occurring salicylates, 56
 nonsteroidal anti-inflammatory drugs (NSAIDs) and colorectal cancer, 59-60

- nonsteroidal
anti-inflammatory drugs
(NSAIDs) and
cyclooxygenase, 56–59
- nonsteroidal
anti-inflammatory drugs
(NSAIDs) use and
reduction of adenoma size
and number in familial
adenomatous polyposis
(FAP), 60–61
- risks of chronic NSAID
therapy for cancer
prevention, 71–72
- structure of COX
inhibitors, 65
- structure of NSAIDs and
related compounds, 64
- worldwide sales of
NSAIDs and COX-2
inhibitors, 69
- COX-2 inhibitors
in the clinic, 66–67
development of, 63–66
worldwide sales of, 69
- COX-independent
mechanisms, 70–71
- COX inhibition
structural basis of,
62–63
- COX isozyme expression
regulation of, 565–68
- COX isozyme inhibition
in human pain states, 569
- COX pharmacology, 560
- CpGV
See *Cydai pomonella*
granulovirus
- CPLA₂, 556–57
- CRABP
See Cellular retinoic acid
binding protein
- CRBP
See Cellular retinol binding
protein
- CREB
See cAMP response
element binding protein
- CrmA
inhibition of apoptosis by,
263–64
- CSAIDS
See Cytokine synthesis
anti-inflammatory drugs
- Cubic ternary complex (CTC)
model
of G protein activation,
351–53, 360
- Current concepts regarding
signaling scaffolds,
306–7
- Current Procedural
Terminology, 120
- Cyclic AMP-dependent
protein kinase, 236
- Cyclin-dependent kinase
inhibitors, 325–48
binding mode of
hymenialdisine, 346
binding mode of indirubin
monoxime, 331
binding mode of inhibitors,
344
binding mode of
purvanalol, 337
combinatorial synthesis of
2,6,9-trisubstituted
purines, 336
discovery and development
of cdk inhibitors, 328–46
hymenialdisine, 345
indirubin and analogues,
331
quinazoline compounds,
344
structural studies on cdk2,
ATP, and cyclins, 327–28
various compounds,
332–33, 336
- Cyclooxygenase (COX)
conversion of arachidonic
acid to PGH₂, 57
inhibitors of, 67–70, 554
metabolic transformations
of PGH₂ to
prostaglandins, 58
and NSAIDs, 56–59
- Cyclosporin A, 81, 92
- Cydai pomonella*
granulovirus (CpGV),
261
- CYP expression inducible by
xenobiotics, 2
- CYP3A subfamily, 2–15
evidence that PXR is a key
regulator of induction by
xenobiotics, 6–11
expression and catalytic
activity, 2–3
identification of novel PXR
target genes, 13
induction by structurally
diverse compounds, 3–4
metabolism of endogenous
compounds, 3
metabolism of xenobiotics,
2–3
pregnane X receptor
(PXR), 5
role of PXR in bile acid
homeostasis, 11–13
transcription regulation by
pregnane X receptor,
1–23
X-ray crystal structure of
the PXR LBD, 13–15
xenobiotic response
elements in, 4–5
- Cyp7a1
See Cholesterol
7 α -hydroxylase
- Cyp7B1
See Oxysterol
7 α -hydroxylase
- Cyp8B1
See Oxysterol
12 α -hydroxylase
- CYP27
See Sterol 27-hydroxylase
- Cyproterone acetate, 4
- Cystathionine B-synthase

- (CBS), 190
 Cytochrome P450
 superfamily (CYPs), 1–2
 CYP expression inducible
 by xenobiotics, 2
 Cytokine inhibitory
 approaches, 92–93
 corticosteroids, 92
 immunomodulators, 92
 NF- κ B inhibitors, 93
 p38 mitogen-activated
 protein (MAP) kinase
 inhibitors, 93
 phosphodiesterase 4
 inhibitors, 92
 Cytokine modulators as novel
 therapies for asthma,
 81–98
 anti-inflammatory
 cytokines, 88–90
 chemokine inhibitors, 82,
 90–92
 inhibition of
 proinflammatory
 cytokines, 87
 inhibition of T helper 2
 (Th2) cytokines, 82–87
 other approaches to
 cytokine inhibition, 92–93
 strategies for inhibiting
 cytokines, 81–83
 Cytokine synthesis
 anti-inflammatory drugs
 (CSAIDS), 93
 Cytokines
 suppression of signaling,
 86
 See also Proinflammatory
 cytokines; T helper 2
 cytokines
 Cytoskeletal organization and
 migration, 542–43
 Cytoskeletal scaffolds
 in the MAP kinase cascade,
 309–10
 signal transduction and,
 306–11
- D**
 D-ala-D-X dipeptides
 production by bacterial
 ligases, 389
 D-cycloserine (DCS),
 171–72
 D-serine, 171
 DAMGO-receptor
 complexes, 363, 421,
 425–26, 428
 Data exchange standards, 122
 DBD
 See DNA binding domain
 DCI
 See Dichloroisoproterenol
 DCS
 See D-cycloserine
 Death effector domains
 (DED), 263
 Death inducing signaling
 complex (DISC), 263
 Decaffeinated green tea
 (DGT), 30–31
 Decreased availability of
 methyl groups causing
 liver tumors in rodents,
 508
 DED
 See Death effector domains
 Delayed Word Recall and
 Verbal Fluency test, 168
 Deltorphan II, 425, 428
 Deschloroflavopiridol, 329
 Development
 of cdk inhibitors, 328–46
 of COX-2 inhibitors,
 63–66
 Developmental processes,
 184–87
 Dexamethasone, 3–8
 DGT
 See Decaffeinated green
 tea
 Dichloroisoproterenol (DCI),
 359–61
 Difluoromethylthiophenols,
 400
- 2,2'-Dihydroxy-di-n-
 propylnitrosamine,
 41
 Dimerization
 co-immunoprecipitation as
 a tool to determine homo-
 and heterodimerization,
 410–11
 constitutive vs.
 ligand-promoted, 414–19
 emerging concept for G
 protein-coupled receptors
 ontogeny and function,
 409–35
 of glycopeptide antibiotics,
 385
 Dimers
 bioluminescence resonance
 energy transfer, 411–12
 detection in living cells,
 411–14
 effect of agonist on
 detection, 416–18
 fluorescence resonance
 energy transfer, 412–14
 as signal transducing units,
 422–27
 Dimethylamiloride (DMA),
 530–31
 (±)-1-(2,5-Dimethoxy-4-
 iodophenyl)-2-
 aminopropane (DOI),
 359
 7,12-Dimethylbenz[a]anthra-
 cene (DMBA), 32, 38,
 40
 Dioxins, 188
 Dipeptides
 See D-ala-D-X dipeptides
 Direct activation of MAP
 kinase cascades by
 integrins, 289–91
 Direct regulation of NHE1,
 535–38
 additional regulatory sites,
 537–38
 binding and interaction

- sites on the cytoplasmic domain of NHE1, 536
calmodulin, 537
phosphorylation, 535-37
Direct signaling by integrins, 288-93
direct activation of MAP kinase cascades by integrins, 289-91
focal adhesion kinase (FAK), 288-89
integrin effects on Rho GTPases, 291-93
integrin signaling to the cytoskeleton via Rho GTPases, 292
DISC
 See Death inducing signaling complex
Discovery
 of cdk inhibitors, 328-46
 of COX-2, 61-62
Disease and inhibition, 482-88
 of chemokines, 482-88
 of other inhibitors, 488
 other viral protein inhibitors, 483-84
 small-molecule antagonists of chemokine receptors, 484-88
 viral chemokine homologues, 482-83
Diverse databases
 integrating data from, 123
Diversity of
 pharmacogenomic data, 118-20
 clinical data, 120
 genomic data, 118-19
 molecular and cellular data, 119
DMA
 See Dimethylamiloride
DMBA
 See 7,12-Dimethylbenz[a]-anthracene
DNA binding domain (DBD), 5
DNA code
 flow of information from, 109
DNA methylation, 505-6
 and carcinogenesis, 506-9
 decreased availability of methyl groups causing liver tumors in rodents, 508
 hypermethylation, 508-9
 hypomethylation, 506-8
 maintenance of, 507
 multiple factors controlling, 514
 possible inverse relationship between susceptibility to carcinogenesis and capacity of maintaining normal patterns of DNA methylation, 509
Dobutamine (DOB), 359-60
DOI
 See (\pm)-1-(2,5-Dimethoxy-4-iodophenyl)-2-aminopropane
Dopaminergic hypothesis, 166
Dorsal horn at level of the primary afferent synapse, 555
DPDPE, 426
Drosophila melanogaster, 264, 307, 528
Drug and compound names, 121-22
Drug efficacy at G protein-coupled receptors, 349-79
Drug response
 using expression data to assess phenotypes of, 124-25
DuPont, 109
Dysidea etheria, 226
Dysoxylum binectariferum, 329
E
Ebbinghaus, Hermann, 136
EC
 See (-)-Epicatechin
ECG
 See (-)-Epicatechin gallate
ECMs
 See Extracellular matrix proteins
EcoCYC database, 126
Ectromelia virus (EV), 483
Effectors of ERK, 148-52
 K⁺ channel Kv4.2, 151-52
 regulation of CREB phosphorylation in the hippocampus, 150-51
 transcription factor cAMP response element binding protein, 148-49
Efficacy
 in chemical space, relative prevalence of, 366-67
 defined, 349-50
 as a directional vector, 353
 operational measurement of, 367-70
 quality of, 353-54
EGC
 See (-)-Epigallocatechin
EGCG
 See (-)-Epigallocatechin gallate
EGF
 See Epidermal growth factor
Electrophysiological results
 from typical LTP experiment, 141
Endogenous compounds
 metabolism of, 3
Endogenously expressed receptors
 evidence of dimerization for, 427-28

- Endothelium-derived relaxing factor (EDRF), 593
- ENNG
See *N*-Ethyl-*N'*-nitro-*N*-nitrosoguanidine
- Ensembl browser, 118
- Ensemble theory in GPCR dynamics, 354–56
- Enterococci*, 381
- Environmental insult during development
potential consequences of, 185
- Environmentally induced birth defects, 181–208
definitions of congenital anomalies, 183–88
developmental processes, 184–87
gene environment interaction concepts, 188–92
potential consequences of environmental insult during development, 185
proposed molecular mechanisms of known teratogens, 193–99
- Eotaxin, 90
- Epicatechin digallate, 26
- (–)-Epicatechin (EC), 26–27, 29–32, 41
- (–)-Epicatechin gallate (ECG), 26–27, 29–32, 41, 44–45
- Epidemiological studies relating aspirin intake to reduced mortality from colon cancer, 60
on tea and cancer, 41–42
- Epidermal growth factor (EGF), 38, 186, 287, 294
- Epigallocatechin digallates, 26
- (–)-Epigallocatechin (EGC), 26–27, 29–32, 41
bioavailability of, 31
- (–)-Epigallocatechin gallate (EGCG), 26–32, 38–46
bioavailability of, 31
- Epigenetic basis for initiation of carcinogenesis possible, 504–5
- Epigenetic mechanisms and carcinogenesis, 503–4
importance of, 503–5
inheritance considered on a dual level, 503
initiation and cell proliferation in multistage carcinogenesis, 504
possible basis for initiation of carcinogenesis, 504–5
possible key role of increased gene expression without mutation in carcinogenesis, 505
- Epithelial-mesenchymal interactions, 186
- EPSP
See Excitatory postsynaptic potential
- ERK
See Extracellular signal-regulated kinase
- Escherichia casseliflavus*, 391
- E. coli*, 387, 389, 392, 528
- E. faecalis*, 389, 392–93
- E. flavescens*, 391
- E. gallinarum*, 391–92
- Etanercept, 87
- ETC
See Extended ternary complex model
- N*-Ethyl-*N'*-nitro-*N*-nitrosoguanidine (ENNG), 39
- Ethylisopropylamiloride (EIPA), 530
- EV
See *Ectromelia* virus
- Evolution of A-kinase anchoring proteins (AKAPs), 237–38
- Excitatory postsynaptic potential (EPSP), 140
- Expression data
using to assess phenotypes of drug response, 124–25
- Extended ternary complex (ETC) model
of G protein activation, 351–53
- eXtensible Markup Language (XML), 122
- Extracellular matrix (ECM) proteins, 284
- Extracellular-signal-regulated kinase (ERK), 143
biochemical information processing by, 152–54
as a biochemical information storage mechanism, 154
as a biochemical switch, 153
as a coincidence detector, 153–54
effectors of, 148–52
electrophysiological results from typical LTP experiment, 141
general attributes of regulation, 143–44
Hebb's postulate, 135–36
hippocampal formation, 139
kinases in long-term potentiation, 142–43
in long-term potentiation (LTP), 138–43
in memory, 136–38
mitogen-activated protein kinase cascade in memory, 135–63
in neurons, 146–48
regulation in neurons, 143–48
regulation of, 143–48
as a temporal integrator, 154

F

- Familial adenomatous polyposis (FAP), 60–61
- FAO
 - See Food & Agriculture Organization
- FAO/WHO decision tree
 - approach to, 103
- FAP
 - See Familial adenomatous polyposis
- Fat-soluble vitamins, 2, 12
- Fatty acids, 2
- FCA
 - See Freuds complete adjuvant
- FGF
 - See Fibroblast growth factor
- Fibroblast growth factor (FGF), 186, 198, 294
- Flavopiridol, 329
- FLICE-inhibitory proteins (FLIPs), 263
 - and CrmA and p35, 263–64
 - inhibition of apoptosis by, 263–64
- Fluorescence resonance energy transfer (FRET), 412–14
 - fluorescent ligands, 414
 - with GFP, 412–13
 - homogeneous time resolved, 413
 - photobleaching, 413
- Fluorescent ligands, 414
- Focal adhesion kinase (FAK), 288–89
- Folate receptor alpha (FR α), 190
- Food & Agriculture Organization (FAO), 100, 102–4, 106–9
- Food and Drug Administration
 - COSTART, 122
 - Standard Product

- Nomenclature, 122
- Foods produced through
 - agricultural biotechnology, 99–112
 - application of allergenicity assessment, 109–10
 - assessment of allergenicity of foods produced through agricultural biotechnology, 101–9
 - safety of foods produced through agricultural biotechnology, 100–1
- FR α
 - See Folate receptor alpha
- FRET
 - See Fluorescence resonance energy transfer
- Freuds complete adjuvant (FCA), 557
- Furchgott, method of, 367

G

- G protein-coupled receptors (GPCRs), 296–97
 - co-immunoprecipitation to determine homo- and heterodimerization, 410–11
 - constitutive vs. ligand-promoted dimerization, 414–19
 - detection of dimers in living cells, 411–14
 - dimers as signal transducing units, 422–27
 - evidence of dimerization for endogenously expressed receptors, 427–28
 - internalization, 426–27
 - oligomerization, 364–65
 - ontogeny and function, 409–35
 - pharmacological properties of receptor dimers, 420–22

- proposed functional roles for dimerization, 428–29
- role of receptor dimerization in endoplasmic reticulum export, 419–20
- GABAergic interneurons, 168
- Galocatechin gallate, 28
- Gastrointestinal tract
 - inhibition of tumorigenesis in, 38–39
- GCP II
 - See Glutamate carboxypeptidase II
- GENBANK, 118, 123, 127
- Gene environment interaction
 - concepts, 188–92
 - gene expression abnormalities, 188–89
 - teratogenic exposure and the susceptible genotype, 189–92
- Gene expression
 - abnormalities in, 188–89
 - without mutation in carcinogenesis, possible key role of increased, 505
- Genetic variations
 - understanding structural consequences of, 125–26
- Genomic pharmacogenomic data, 118–19
- GFP
 - See Green fluorescent protein
- Glucocorticoids, 81
- Glucuronidation, 29
- Glutamate carboxypeptidase II (GCP II), 169
- Glutamate receptors
 - metabotropic, 167
- Glutamatergic mechanisms in schizophrenia, 165–79
- Glutamatergic systems, 166–67
- Glutathione *S*-transferase (GST), 39, 45

- Glycine, 171
- Glycopeptide antibiotics
- bactericidal effect of vancomycin on Gram-positive bacteria, 384
 - dimerization of, 385
 - heptapeptide backbone for vancomycin and teicoplanin, 383
 - structure and mechanism of action, 382–84
 - structures for vancomycin and teicoplanin, 382
- Glycopeptide resistance,
- 381–408
 - dimerization of glycopeptide antibiotics, 385
 - mechanism of action of the *vanR-vanS* two-component regulatory system, 397
 - mechanism of vancomycin resistance in staphylococci, 394
 - in other organisms, 395–96
 - regulation of van gene expression, 396–97
 - in staphylococci, 393–94
 - in streptococci, 394–95
- Glycopeptide resistance in enterococci, 386–93
- hydrolysis of D-ala-D-ala dipeptide by VanX, 390
 - orientation of vanH active site, 388
 - production of D-ala-D-X dipeptides by bacterial ligases, 389
 - resistance mechanism to vancomycin by *vanHAX* type resistance, 391
 - van* gene clusters that confer resistance to glycopeptide antibiotics, 387
 - VanA, 386–90
 - VanB, 391
 - VanC, 391–92
 - VanD, 392
 - VanE, 392–93
 - VanG, 392–93
- Glycopeptide resistance in staphylococci, 393–94
- mechanism of vancomycin resistance in staphylococci, 394
- Glycopeptide resistance in streptococci, 394–95
- GPCRs
- See G protein-coupled receptors
- Green fluorescent protein (GFP), 411–12
- Green tea polyphenol fraction (GTPF), 32, 39, 46
- GSNO, 587–89, 591, 595–96
- GSSG
- See Oxidized glutathione
- GST
- See Glutathione S-transferase
- GTPF
- See Green tea polyphenol fraction
- ## H
- Haloenol lactone suicide substrate (HELSS), 558
- Hebb's postulate, 135–36
- HELSS
- See Haloenol lactone suicide substrate
- Heme-thiolate proteins, 1
- Hepatocarcinogenesis
- protection against, 39
- Heptapeptide backbone for vancomycin and teicoplanin, 383
- Herbicide-tolerant soybeans, 99–100
- Hermisenda*, 141
- Heterodimermay, 426–27
- Heterogeneous databases
- integrating data from, 123
- Hippocampus
- formation of, 139
 - regulation of CREB phosphorylation in, 150–51
- HIV-1 infection, 363
- inhibitor of, 350
- Holoprosencephaly (HPE), 189
- Homogeneous time resolved FRET (HTRF), 413
- Human gene names and links to other organisms, 121
- Human genome browsers, 118
- Human Genome Database, 118
- Human pain states
- COX isozyme inhibition in, 569
- Humanized monoclonal antibody
- effect against interleukin-5, 84–85
- Hydrocortisone, 3
- Hydrolysis of D-ala-D-ala dipeptide by VanX, 390
- 17 α -Hydroxypregnenolone, 6
- 17 α -Hydroxyprogesterone, 6
- Hymenialdisine
- binding mode of, 346
 - inhibition of kinases by, 345
- Hyperforin, 8
- Hypermethylation, 508–9
- Hypomethylation, 506–8
- ## I
- ICE
- See Interleukin-1 beta converting enzyme
- Identification
- of novel PXR target genes, 13

- of the nuclear receptor
PXR, 5
- IFBC
 - See International Food
Biotechnology Council
- Ig CAMs
 - See Immunoglobulin cell
adhesion molecule
families
- Igf2*
 - regulation of expression of,
511
- IL-10, 88–89
- IL-12, 89–90
- IL-18, 89–90
- ILK
 - See Integrin-linked kinase
- ILSI
 - See International Life
Sciences Institute
- Immunoglobulin cell
adhesion molecule (Ig
CAM), 283–84
- superfamilies, 287
- Immunomodulators, 92
- Imprinting, 510–12
 - regulation of expression of
Igf2, 511
 - regulation of expression of
M6P-Igf2r, 512
- In silico* screening, 15
- In vivo COX-1 and COX-2
 - localization in spinal
cord, 559
- In vivo factors
 - in signal transduction
pathways, 567–68
- Indirubin and analogues, 330
 - inhibition of cyclin
dependent kinases by, 331
- Indirubin monoxime
 - binding mode of, 331
- Inducible nitric oxide (iNOS),
43
- Induction
 - of *CYP3A* genes by
structurally diverse
compounds, 3–4
 - of spinal COX isozymes,
559–60
 - of spinal PLA₂ isozymes,
557
- Infliximab, 87
- Information
 - managing laboratory,
126–27
- Inheritance
 - considered on a dual level,
503
- Inhibition
 - binding mode of, 344
 - of cdk's by quinazoline
compounds, 344
 - of cyclooxygenases, 67–70
 - of cytokines, strategies for,
81–83
 - of invasiveness, and
angiogenesis, 45
 - of kinases by
hymenialdisine, 345
 - of mammary gland
tumorigenesis, 40
 - of MAP-kinases, AP-1,
and related activities, 43
 - of multi-organ
tumorigenesis, 41
 - of NF κ B and related
activities, 43
 - of STAT-6, 86
- Inhibition of apoptosis, 43–44
 - Bcl-2 family members,
265–68
 - FLICE-inhibitory protein,
263–64
 - ionic repression of
apoptosis, 270–72
 - at the level of caspases,
261–64
 - at the level of the
mitochondria, 264–68
 - at the level of the plasma
membrane, 268–72
 - volume regulatory
responses, 269–70
- Inhibition of apoptosis
proteins (IAP)
 - family members, 261–62
- Inhibition of carcinogenesis
 - by tea, 25–54
 - antioxidative properties of
tea polyphenols, 28–29
 - bioavailability and
pharmacokinetics, 29–32
 - epidemiological studies on
tea and cancer, 41–42
 - inhibition of tumorigenesis
in animal models, 32–41
 - mechanisms of anticancer
activities, 42–46
 - tea chemistry, 26–28
- Inhibition of
 - cyclin-dependent
kinases, 325–48
 - binding mode of
hymenialdisine, 346
 - binding mode of indirubin
monoxime, 331
 - binding mode of inhibitors,
344
 - binding mode of
purvanalol, 337
 - combinatorial synthesis of
2,6,9-trisubstituted
purines, 336
 - discovery and development
of cdk inhibitors, 328–46
 - inhibition by compounds,
332–33, 336
 - inhibition by
hymenialdisine, 345
 - inhibition by indirubin and
analogues, 331
 - inhibition by quinazoline
compounds, 344
 - structural studies on cdk2,
ATP, and cyclins, 327–28
- Inhibition of proinflammatory
cytokines, 87
 - anti-IL-1, 87
 - anti-TNF, 87

- Inhibition of T helper 2 (Th2)
 cytokines, 82-87
 anti-IL-4, 85-86
 anti-IL-5, 82-85
 anti-IL-9, 87
 anti-IL-13, 86-87
 effect of humanized
 monoclonal antibody
 against interleukin-5,
 84-85
- Inhibition of tumorigenesis in
 animal models, 32-41
 inhibition of mammary
 gland tumorigenesis, 40
 inhibition of multi-organ
 tumorigenesis, 41
 inhibition of tumorigenesis
 in gastrointestinal tract,
 38-39
 inhibitory action against
 transplantable tumors, 41
 protection against
 hepatocarcinogenesis, 39
 protection against lung
 tumorigenesis, 33, 38
 protection against
 pancreatic and bladder
 carcinogenesis, 40
 protection against skin
 tumorigenesis, 32-33
- Inhibition of tumorigenesis in
 gastrointestinal tract,
 38-39
- Inhibitory action against
 transplantable tumors,
 41
- Initiation
 in multistage
 carcinogenesis, 504
- INOS
 See Inducible nitric oxide
- Insect-resistant corn, 99-100
- Integrating data
 from diverse and
 heterogeneous databases,
 123
- Integrin and cytoskeletal
 modulation
 of the RTK/Ras/MAPK
 cascade, 293-96
 of signaling through
 cytokine receptors,
 297-99
 of signaling through G
 protein-coupled receptors,
 296-98
- Integrin effects on Rho
 GTPases, 291-93
- Integrin-linked kinase (ILK),
 302
- Integrin modulation of signal
 transduction cascades,
 293-99
- integrin and cytoskeletal
 modulation of signaling
 through cytokine
 receptors, 297-99
- integrin and cytoskeletal
 modulation of signaling
 through G
 protein-coupled receptors,
 296-98
- integrin and cytoskeletal
 modulation of the
 RTK/Ras/MAPK cascade,
 293-96
- Integrin signaling to the
 cytoskeleton via Rho
 GTPases, 292
- Integrins, 284-86
- Interaction sites
 on the cytoplasmic domain
 of NHE1, 536
- Interference on receptor
 binding and related
 activities, 44-45
- Interferons, 89
- Interleukin-1 beta converting
 enzyme (ICE), 263, 271
- Internalization, 363, 426-27
- International Classification of
 Diseases standard, 120
- International Food
 Biotechnology Council
 (IFBC), 102
- International Life Sciences
 Institute (ILSI)
 Allergy & Immunology
 Institute, 102
- Interrelationships between
 mutagenesis, genome
 stability, and altered
 DNA methylation,
 509-10
- Intracellular cyclic AMP, 92
- Intrathecal cyclooxygenase
 inhibitors
 in rat models of
 nociception, 561-62
- Invasiveness
 inhibition of, and
 angiogenesis, 45
- Ionic repression of apoptosis,
 270-72
- Ionotropic glutamate
 receptors, 167
- IPLA₂, 557
- Ircinia*, 226
- Isoproterenol (ISO), 359
- J**
 James, William, 136
- K**
 K⁺ channel Kv4.2, 151-52
 Kaposi's sarcoma, 482
 KEGG
 See Kyoto Encyclopedia of
 Genes and Genomes
 Kenpaullone, 330
 Kinases
 inhibition by
 hymenialdisine, 345
 in long-term potentiation,
 142-43
 Kinetics
 of COX-2 inhibition, 66
 of receptor activation, 362
 Kyoto Encyclopedia of Genes
 and Genomes (KEGG),
 126

L

Laboratory information management systems (LIMS), 126-27
Lactobacillus pentosus, 386
 Lamellipodia, 542
 Lansoprazole, 4
 LBD
 See Ligand-binding domain
 LCA
 See Lithocholic acid
Leuconostoc mesenteroides, 395
 Leukotrienes, 2
 LHRH
 See Lutenizing hormone-releasing hormone
 Ligand-binding domain (LBD), 5, 7
 residues in the transmembrane implicated in, 440-45
 signaling by, 303-4
 Ligand-selective receptor conformations
 for receptor signaling, 358-60
 and therapeutic utility, 362
 Ligand-selective receptor states, 356-58
 LIMS
 See Laboratory information management systems
 Linkage theory
 models of GPCRs described with, 352
 Lithocholic acid (LCA), 3, 8
 Long-term depression (LTD), 140-43
 Long-term memory (LTM), 137, 139-41
 Long-term potentiation (LTP), 140, 142-43
 Lung tumorigenesis

 protection against, 33, 38
 Lutenizing hormone-releasing hormone (LHRH), 422
 LY311727, 558
 LY333328, 398-99
M
M6P-Igf2r
 regulation of expression of, 512
 Macrophage chemoattractant protein (MCP), 90, 425
 Madin-Darby canine kidney (MDCK) cells, 542
 MAFP
 See Methyl arachidonyl fluorophosphonate
 mAKAP
 negative feedback loop coordinated by, 240
 signaling complex at the perinuclear membrane of cardiomyocytes, 239-41
 signaling complex at the sarcoplasmic reticulum, 241-42
 MAML
 See MicroArray Markup Language
 Mammary gland tumorigenesis
 inhibition of, 40
 MAP kinase kinase (MAPKK), 144-45, 306
 MAP kinase kinase kinase (MAPKKK), 144-45, 306
 MAP kinases (MAPKs), 288, 567
 inhibition of, 43
 MAPK signaling cascades
 superfamily of, 144-46
 Mapping
 with the substituted-cysteine

 accessibility method, 449-50
 MAPs
 See Mitogen-activated proteins
 Mathematical and operational treatment of efficacy, 351-53
 MCP
 See Macrophage chemoattractant protein
 MDC
 See Monocyte-derived chemokine
 MDCK
 See Madin-Darby canine kidney cells
 MDR
 See Multidrug resistance
 Mediated signal transduction, 235-57
 coordination of multivalent signaling complexes, 238
 cyclic AMP-dependent protein kinase, 236
 evolution of AKAP, 237-38
 muscle A-kinase anchoring proteins, 238-48
 regulation of PKA by AKAP, 236-37
 Medical Subject Heading keywords, 121
 MEDLINE database, 121
 Medline/PubMED, 123
 Melanocortin-stimulating hormone (MSH) receptor, 422
 Mepolizumab, 84-85
 Met-RANTES, 91
 Metabolic transformations of PGH₂ to prostaglandins, 58
 Metabolism
 of celecoxib in humans, 67
 of endogenous compounds, 3

- of refecoxib in humans, 68
- of xenobiotics, 2–3
- Metabotropic glutamate receptors, 167
- Metallonitrosyls, 585
- Metalloproteinases (MMP), 45
- Methanethiosulfonate (MTS), 449
- Methicillin-resistant
 - Staphylococcus aureus* (MRSA), 381
- Methionine synthase (MS), 190
- Methionine synthase reductase (MTRR), 190
- Methyl arachidonyl fluorophosphonate (MAFP), 557
- 3-*O*-Methyl EC, 26
- N*-Methyl-*N'*-nitro-*N*-nitrosoguanidine (MNNG), 39
- Methylated catechins, 29
- Methylation
 - heritable, aberrant patterns of, 517
 - normal patterns of, 517
- 5,10-Methylene-tetrahydrofolate reductase (MTHFR), 190
- Methylenetetrahydrofolate dehydrogenase (MTHFD), 190
- (4-Methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK), 33, 38–39
- N*-Methylnitrosourea, 41
- α -ethylprednisolone, 3
- 5-*N*-(Methylpropyl)amiloride (MPA), 531
- MGLuR functioning, 141
- Microarray Gene Expression Database, 119
- MicroArray Markup
 - Language (MAML), 119
- Mifepristone (RU486), 3–4, 6, 8
- Mini Mental State Exam, 168
- Mitochondria
 - Bcl-2 family members, 265–68
 - inhibition of apoptosis at the level of, 264–68
- MKP3 substrate recognition mechanism of, 219–20
- MMP
 - See Metalloproteinases
- MNNG
 - See *N*-Methyl-*N'*-nitro-*N*-nitrosoguanidine
- Modeller, 450
- Molecular basis of
 - environmentally induced birth defects, 181–208
 - definitions of congenital anomalies, 183–84
 - developmental processes, 184–87
 - gene environment
 - interaction concepts, 188–92
 - potential consequences of environmental insult during development, 185
 - proposed molecular mechanisms of known teratogens, 193–99
- Molecular basis of
 - phospho-peptides recognition by PTP1B, 214–17
- Molecular mechanisms of
 - known teratogens, 193–99
 - retinoids, 194–97
 - thalidomide, 193–94
 - valproic acid, 197–99
- Molecular model for NMDA receptor regulation by
 - ytio-anchored PKA and PPI, 247–48
- Molecular pharmacogenomic data, 119
- Molecular physiology of
 - NHE1, 530
- Molecular psychology
 - biochemical information processing by ERK, 152–54
 - effectors of ERK, 148–52
- ERK in long-term potentiation (LTP), 138–43
- ERK in memory, 136–38
- Hebb's postulate, 135–36
- hippocampal formation, 139
- regulation of ERK in neurons, 143–48
- roles for the extracellular-signal regulated kinase (ERK)/mitogen-activated protein kinase (MAPK) kinase cascade in memory, 135–63
- Mollusum contagiosum*, 483
- Monocyte-derived chemokine (MDC), 92
- Morris water maze task, 141
- Mossy fiber path, 140
- MPA
 - See 5-*N*-(Methylpropyl)amiloride
- MRSA
 - See Methicillin-resistant *Staphylococcus aureus*
- MS
 - See Methionine synthase
- MSH
 - See Melanocortin-stimulating hormone receptor
- MTHFD
 - See Methylenetetrahydrofolate

- dehydrogenase
MTHFR
 See 5,10-Methylene-tetrahydrofolate reductase
MTRR
 See Methionine synthase reductase
MTS
 See Methanethiosulfonate
Multi-organ tumorigenesis
 inhibition of, 41
Multidrug resistance (MDR), 8, 10, 13
Multiple factors controlling DNA methylation, 514
Multistage carcinogenesis
 initiation and cell proliferation in, 504
Muscle A-kinase anchoring proteins (mA-KAPs), 238–48
 AKAP220, 242–43
 AKAP220 signaling complexes, 244
 AKAP 350/450/CG-NAP coordinated signaling complexes, 246–47
 AKAP 350/450/CG-NAP/YOTIAO, 244–46
mA-KAP signaling
 complex at the perinuclear membrane of cardiomyocytes, 239–41
mA-KAP signaling complex
 at the sarcoplasmic reticulum, 241–42
 molecular model for NMDA receptor regulation by yotiao-anchored PKA and PPI, 247–48
 negative feedback loop coordinated by mA-KAP, 240
 RII binding enhancing PPI inhibition by AKAP220, 245
 yotiao and NMDA receptor function, 247–48
Mutagenesis
 site-directed, 439–48
Mutagenic potential, 182–83
Myophenolate, 81
- N**
N-acetyl aspartate (NAA), 166
N-acetyl aspartyl glutamate (NAAG), 169
N-methyl-D-aspartate (NMDA) receptor, 307, 556, 563, 565
Na⁺/H⁺ exchanger (NHE1)
 cellular actions of, 538–43
 effect on cell proliferation, 541
 molecular physiology of, 530
 pharmacological inhibition of, 530–32
 regulation of, 532–38
 signaling networks regulating, 533–35
 structural topology of, 528–30
 structure, regulation, and cellular actions, 527–52
NADPH-quinone oxidoreductase, 45
National Center for Biotechnology Information (NCBI)
 browser, 118
National Library of Medicine Unified Medical Language System project, 121
Natural language processing (NLP) techniques, 123
NCBI
 See National Center for Biotechnology Information
- NDEA**
 See *N*-Nitrosodiethylamine
Negative feedback loop
 coordinated by mA-KAP, 240
Nerve growth factor (NGF), 186, 198–99
Netherland Cohort Study on Diet and Cancer, 42
Networks
 See Signaling networks
Neural glial cell adhesion molecule (Ng CAM), 287
Neural linkages, 556
Neural tube closure (NTC), 197
Neural tube defects (NTDs), 190–91, 197–98
Neurokinin-1 (NK1), 556
NFκB, 567
 inhibition of, 43, 93
Ng CAM
 See Neural glial cell adhesion molecule
NGF
 See Nerve growth factor
NHE1
 See Na⁺/H⁺ exchanger
NHEK
 See Normal human epidermal keratinocytes
Nitric oxide
 and the blood stream, 592–95
***N*-Nitroso-bis(2-oxopropyl)amine (BOP)**, 40
***N*-Nitrosodiethylamine (NDEA)**, 33, 39, 41
***N*-Nitrosomethylbenzylamine (NMBzA)**, 39
NK1
 See Neurokinin-1
NMBzA
 See *N*-Nitrosomethylbenzylamine

NMDA

See N-methyl-D-aspartate receptor

NMDA receptor function

yotiao and, 247–48

NNK

See

(4-Methylnitrosamino)-1-(3-pyridyl)-1-butanon

NNT

See “Numbers-needed-to-treat”

Nociceptive processing

antihyperalgesic vs. analgesic actions of NSAIDs, 554

biology of the spinal cascade induced by tissue injury, 554–56

central nervous system actions of COX inhibitors in man, 568–69

clinical importance of research, 569–70

regulation of spinal PLA₂ and COX isozyme expression, 565–68

role of constitutive vs. inducible spinal COX-2 in, 568

spinal cyclooxygenase (COX) isozymes, 558–63

spinal phospholipase A₂ (PLA₂) isozymes, 556–58

spinal phospholipase-cyclooxygenase-prostanoid cascade in, 553–83

spinal prostaglandins (PG), 563–65

Noninflammatory-induced

experimental pain, 568–69

NONMEM software, 120**Nonsteroidal**

anti-inflammatory drugs

(NSAIDs)

and colorectal cancer, 59–60

and cyclooxygenase, 56–59

epidemiological studies relating aspirin intake to reduced mortality from colon cancer, 60

and metabolic transformations of PGH₂ to prostaglandins, 58

and reduction of adenoma size and number in familial adenomatous polyposis, 60–61

and risk reduction in human sporadic colorectal carcinoma, 59–60

worldwide sales of, 69

Normal distributions of receptor microstates, 355

Normal human epidermal keratinocytes (NHEK), 43

Normal patterns of DNA methylation, 517

possible inverse relationship to susceptibility to carcinogenesis, 509

Novel genes

source of, 102–4

Novel proteins

level of expression of, 109

NTC

See Neural tube closure

NTDs

See Neural tube defects

NU2058, 339

NU6027, 340

NU6102, 341

Nuclear receptor PXR

identification of, 5

“Numbers-needed-to-treat” (NNT), 553

O

O-nitroso compounds, 585

Oatp2

See Organic anion transporter 2

Olomoucine, 334, 336–37

Omeprazole, 4

OMIM

See Online Mendelian

Inheritance in Man database

Online Mendelian Inheritance in Man (OMIM) database, 119, 123

OpNPV

See *Orrgyia pseudotsugata nucleopolyhedrovirus*

Organic anion transporter 2 (Oatp2), 11–12

Organochloride pesticides, 4

Oritavancin, 398

Orrgyia pseudotsugata nucleopolyhedrovirus (OpNPV), 261

Oxidized glutathione (GSSG), 587–88, 591, 595–96

Oxidoreductase

NADPH-quinone, 45

Oxysterol 7 α -hydroxylase (Cyp7B1), 11

Oxysterol 12 α -hydroxylase (Cyp8B1), 11

P

P21 activated kinase (PAK), 291, 308

p35

inhibition of apoptosis by, 263–64

P38 mitogen-activated protein kinase inhibitors, 93

Paclitaxel, 4

PACT

See Pericentrin-AKAP450 centrosomal targeting domain

- Paenibacillus popillae*, 395
- Pain
See Human pain states
- PAK
See p21 activated kinase
- Pancreatic carcinogenesis
protection against, 40
- Papaya
virus-resistant, 100
- Pathways
See Signal transduction pathways; Sonic hedgehog pathway; WNT pathway
- Paullones, 330
- Pavlovian conditioning, 137
- PBREM
See Phenobarbital-responsive enhancer module region
- PCN
See Pregnenolone 16 α -carbonitrile
- PDB
See Protein Data Bank
- PDGF
See Platelet-derived growth factor
- Peptidoglycan, 383–84
- Pericentrin-AKAP450
centrosomal targeting (PACT) domain, 246
- Peroxisome Proliferator Activated Receptors (PPARs), 58
- Pesticides
organochloride, 4
- PET
See Positron emission tomographic studies
- Pharmacogenetics
defined, 115
- Pharmacogenomic data
clinical, 120
diversity of, 118–20
genomic, 118–19
molecular and cellular, 119
- Pharmacogenomics
approaches to, 116
defined, 115
- Pharmacokinetics
of tea polyphenols, 30–32
- Pharmacological agents
currently used to inhibit NHE1 activity, 531
- Pharmacological inhibition of NHE1, 530–32
classes of pharmacological agents currently used to inhibit NHE1 activity, 531
- Pharmacological properties
of ligands, 357
of receptor dimers, 420–22
- Pharmacological specificity
structural bases of, 452–54
- PharmGKB database, 122, 128
- Phencyclidine (PCP) link, 167–68
- Phenobarbital, 4
- Phenobarbital-responsive enhancer module region (PBREM), 10
- Phenotype-to-genotype
approaches, 116–17
- Phenotypes of drug response
using expression data to assess, 124–25
- Phenylbutazone, 4
- Phenytoin, 4
- Phosphodiesterase 4
inhibitors, 92
- Phosphorylation, 535–37
of tyrosine, 209–10
- Photobleaching FRET (pbFRET), 413
- Pioneer Hi-Bred International, 109
- PKA
coupling to ERK2, 147
regulation by A-kinase anchoring protein, 236–37
- PLA₂ pharmacology, 557–58
- Plasma membrane
inhibition of apoptosis at the level of, 268–72
ionic repression of apoptosis at, 270–72
volume regulatory responses at, 269–70
- Plasticity
“synaptic,” 136, 142
- Platelet-derived growth factor (PDGF), 186, 294
- Polychlorinated biphenyls, 4
- Polymorphism
A1298C, 190
- Positron emission tomographic (PET) studies, 166, 170
- Potatoes
genetically modified, 100
- PPAR δ gene, 58–59, 71
- PPARs
See Peroxisome Proliferator Activated Receptors
- 5 β -Pregnane-3,20-dione, 6, 8
- Pregnane X receptor (PXR), 5
bile acids binding and activating, 12
binding to response elements in xenobiotic inducible genes, 9
binding to xenobiotic response elements in CYP3A promoters, 7–10
chemical structures of xenobiotic and endogenous compounds known to activate, 8
expression patterns of, 6
identification of the nuclear receptor PXR, 5
as a key regulator of CYP3A induction by xenobiotics, 6–11
potential utility in treatment of cholestasis, 12–13
regulating CYP3A gene

- transcription, 1–23
 regulating genes involved
 in bile acid synthesis,
 transport, and
 metabolism, 11–12
 role in bile acid
 homeostasis, 11–13
 targeted disruption of the
 PXR gene in mice, 10–11
 transgenic models, 11
 xenobiotics binding and
 activating, 6–7
- Pregnenolone
 16 α -carbonitrile (PCN),
 2, 8
- Primary sequence, 471–72
- Privacy of clinical phenotype
 data
 protecting, 127–28
- Proinflammatory cytokines
 inhibition of, 87
- Proliferation, 539–40
- Proline-directed
 serine/threonine kinases,
 144
- Prostaglandin receptors, 564
- Prostaglandins, 2
- Prostanoids, 554
 synthesis of, 563
- Protean agonism, 360–61
- Protein allergenicity
 assessment of foods
 produced through
 agricultural
 biotechnology, 99–112
 application of allergenicity
 assessment, 109–10
 assessment of allergenicity
 of foods produced
 through agricultural
 biotechnology, 101–9
 foods produced through
 agricultural
 biotechnology, 99–100
 safety of foods produced
 through agricultural
 biotechnology, 100–1
- Protein Data Bank (PDB),
 119, 123, 125
- Protein kinase A (PKA), 308
- Protein kinase database, 119
- Protein tyrosine phosphatase
 (PTP) inhibitor
 development
 Cdc25 inhibitors, 226–27
 PTP1B inhibitors, 221–26
- Protein tyrosine phosphatase
 (PTP) structure and
 function, 210–20
 correlation between effect
 of mutagenesis and PTPs,
 213–14
 functional significance of
 PTP1B active site
 plasticity, 217–19
 mechanism of MKP3
 substrate recognition,
 219–20
 molecular basis of
 phospho-peptides
 recognition by PTP1B,
 214–17
 PTP substrate specificity,
 212–14
- Proteins
 heme-thiolate, 1
- Proteoglycans
 signaling by, 305
- PTP substrate specificity,
 212–14
- PTP1B active site plasticity
 functional significance of,
 217–19
- PTP1B inhibitors, 221–26
 strategy for creating
 selective and high-affinity
 PTP1B inhibitors, 223
 structures of
 difluorophosphonate-
 containing PTP1B
 inhibitors, 224
 structures of
 nonphosphorus
 small-molecule PTP1B
 inhibitors, 225
- Published literature
 mining for
 pharmacogenomic data,
 123–24
- Purvalanol
 binding mode of, 337
- PXR
 See Pregnane X receptor
- PXR LBD
 X-ray crystal structure of,
 13–15
- PXR target genes
 Identification of novel, 13
- Q**
- Quaternary structures,
 474–76
- Quinazoline compounds
 inhibition of cdk by, 344
- Quinazoline ring system
 template, 342–44
- R**
- RANTES
 See Regulated on
 activation, normal T
 cell-expressed
 and -secreted
- Rapamycin, 92
- RARs
 See Retinoic acid receptors
- Rat neonatal ventriculocytes
 (RNV), 239
- Reactive oxygen species
 (ROS), 267
- Receptor dimerization
 role in endoplasmic
 reticulum export, 419–20
- Receptor genotype vs.
 phenotype
 “conditional” efficacy of,
 365–66
- Receptor microstates
 normal distributions of,
 355
- Receptor systems

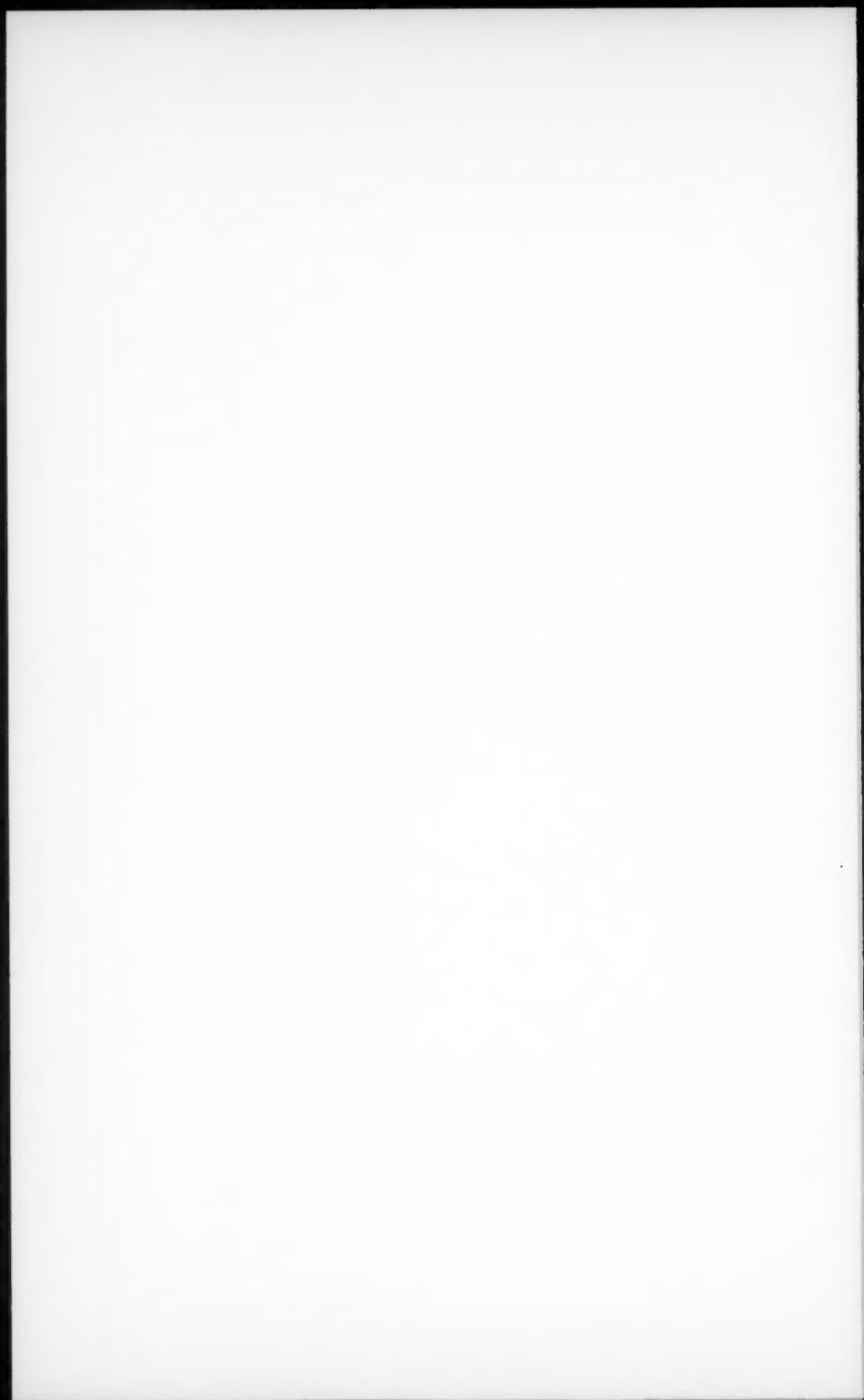
- stimulus-response mechanisms of, 370
- Receptor tyrosine kinase (RTK), 293, 310
- Receptors
- activation of, 454
 - phosphorylation and desensitization of, 362-63
 - See also Glutamate receptors; Retinoic acid receptors; Retinoid X receptors
- Red fluorescent protein (RFP), 412
- Reduced folate carrier (RFC), 190
- Refecoxib
- metabolism of, in humans, 68
- Regulated on activation, normal T cell-expressed and -secreted (RANTES), 90-91, 350, 425, 478-79, 482, 484, 486
- Regulation
- of CREB phosphorylation in the hippocampus, 150-51
 - of expression of *Igf2*, 511
 - of expression of *M6P-Igf2r*, 512
 - of PKA by A-kinase anchoring protein, 236-37
 - of van gene expression, 396-97
- Regulation of *CYP3A* gene transcription by pregnane X receptor (PXR), 1-23
- CYP3A* subfamily, 2-15
- cytochrome P450 superfamily (CYPs), 1-2
- Regulation of ERK in neurons, 143-48
- general attributes of, 143-44
 - PKA coupling to ERK2, 147
 - superfamily of MAPK signaling cascades, 144-46
- Regulation of NHE1 activity, 532-38
- direct, 535-38
 - signaling networks for, 533-35
- Regulation of signaling cascades by cell-cell adhesion receptors, 299-305
- by cadherins/ β -catenin, 299-303
 - by Ig CAMs, 303-4
 - by proteoglycans, 305
 - by selectins, 304-5
 - in the WNT pathway by cadherins, 301
- Regulation of spinal PLA₂ and COX isozyme expression, 565-68
- factors regulating spinal PLA₂-COX-2 induction, 565-66
 - signal transduction pathways linked to transcriptional activation, 566-68
- Regulatory responses
- volume, 269-70
- Regulatory sites, 537-38
- Regulatory volume decrease (RVD), 269
- Regulatory volume increase (RVI), 269-71
- Release
- of spinal prostanoids, 564
- Renilla reniformis*, 411
- Repression of apoptosis
- ionic, 270-72
- Residue numbering
- general indexing method for, 438
- Residues in the transmembrane domain implicated in ligand binding, 440-45
- Resistance
- to pepsin, 107
 - to vancomycin by *vanHAX* type resistance, 391
- Resource Description Framework, 122
- Retinoic acid receptors (RARs), 194-96
- Retinoid X receptors (RXRs), 194, 196
- Retinoids, 194-97
- RFC
- See Reduced folate carrier
- RFP
- See Red fluorescent protein
- Rhodopsin, 450, 454
- Rifampicin, 4-8, 16
- RII binding
- enhancing PPI inhibition by AKAP220, 245
- RING domains, 262
- Risks
- of chronic NSAID therapy for cancer prevention, 71-72
 - reducing in human sporadic colorectal carcinoma, 59-60
- Rofecoxib, 66-67, 69
- Rohitukine, 329
- Role of constitutive vs. inducible spinal COX-2 in nociceptive processing, 568
- ROS
- See Reactive oxygen species
- Roscovitine, 334, 336, 338
- RSNO, 585-89, 595
- RTK
- See Receptor tyrosine kinase
- RU486
- See Mifepristone

- RVD
 See Regulatory volume decrease
- RVI
 See Regulatory volume increase
- RXR α s
 See Retinoid X receptors
- S**
- S-adenosylmethionine (SAM), 507
- S-nitrosoglutathione, 587
- S-nitrosothiols, 585, 589
 and the blood stream, 592-95
 as modulators of enzyme activity, 589-90
 and signal transduction, 590-92
- SAAM 30 software, 120
- Saccharomyces cerevisiae*, 528
- Safety
 of foods produced through agricultural biotechnology, 100-1
- Salicylates
 naturally occurring, 56
- Salmon
 genetically modified, 100
- SAM
 See S-adenosylmethionine
- Schaffer-collateral path, 140
- Schizophrenia
 glutamatergic mechanisms in, 165-79
- Schizosaccharomyces pombe*, 528
- Second extracellular loop, 437-67, 454-57
- Second-site revertant mutations, 448-49
- Secondary mechanism concept
 significance of, 501-2
- Secondary structure, 472
- Selectins, 287-88
 signaling by, 304-5
- Sequence homology to known allergens, 104-5
 tests for, 105
- Serum screening specific, 105-6
 targeted, 106-7
- SHH
 See Sonic hedgehog pathway
- Signal transduction
 adhesion receptor families, 284-88
 by cell adhesion receptors, and the cytoskeleton, 283-323
 and cytoskeletal scaffolds, 306-11
 direct signaling by integrins, 288-93
 mediated, 235-57
- Signal transduction cascades
 integrin modulation of, 293-99
 regulation by cell-cell adhesion receptors, 299-305
- Signal transduction
 knowledge environment (STKE), 126
- Signal transduction pathways
 linked to transcriptional activation, 566-68
 MAP kinases (MAPKs), 567
 NF-kappaB, 567
 steroids, 567
 in vivo factors, 567-68
- Signaling
 by cadherins/ β -catenin, 299-303
 by Ig CAMs, 303-4
 by integrins, direct, 288-93
 by proteoglycans, 305
 by selectins, 304-5
- in the WNT pathway, cadherins regulating, 301
- Signaling cascades
 regulation by cell-cell adhesion receptors, 299-305
- Signaling networks
 regulating NHE1, 533-35
- Signaling scaffolds
 current concepts regarding, 306-7
 cytoskeleton as, 307-11
 in the MAP kinase cascade, 309-10
- Site-directed mutagenesis, 439-48
 effects of mutations on receptor isomerization, 446-47
 identification of direct ligand contacts, 447-48
- Skin tumorigenesis
 protection against, 32-33
- Small-molecule antagonists
 of chemokine receptors, 484-88
- SNAP, 589-91
- Sonic hedgehog (SHH)
 pathway, 189
- Soybeans
 herbicide-tolerant, 99-100
- Specific serum screening, 105-6
- Spinal cyclooxygenase (COX) isozymes, 558-63
 blockade of COX isozyme expression, 563
 constitutive location of spinal COX isozymes, 558-59
 induction of, 559-60
 induction of spinal COX isozymes, 559-60
 intrathecal cyclooxygenase inhibitors in rat models of nociception, 561-62

- pharmacology of, 560
 in regulating hyperalgesic behavior, 560–63
 in vivo COX-1 and COX-2 localization in spinal cord, 559
 Spinal drug delivery, 569
 Spinal phospholipase A₂ (PLA₂) isozymes, 556–58
 constitutive spinal localization of PLA₂ isozymes, 557
 cPLA₂, 556–57
 induction of spinal PLA₂ isozymes, 557
 iPLA₂, 557
 PLA₂ pharmacology, 557–58
 spinal PLA₂ in regulating hyperalgesic behavior, 558
 sPLA₂, 557
 Spinal phospholipase-cyclooxygenase-prostanoid cascade in nociceptive processing, 553–83
 antihyperalgesic vs. analgesic actions of NSAIDs, 554
 biology of the spinal cascade induced by tissue injury, 554–56
 central nervous system actions of COX inhibitors in man, 568–69
 clinical importance of research, 569–70
 regulation of spinal PLA₂ and COX isozyme expression, 565–68
 role of constitutive vs. inducible spinal COX-2 in nociceptive processing, 568
 spinal cyclooxygenase (COX) isozymes, 558–63
 spinal phospholipase A₂ (PLA₂) isozymes, 556–58
 spinal prostaglandins (PG), 563–65
 Spinal PLA₂ isozymes, induction of, 557
 in regulating hyperalgesic behavior, 558
 regulation of, 565–68
 Spinal PLA₂-COX-2 induction
 factors regulating, 565–66
 Spinal prostaglandins (PG), 563–65
 Spinal prostanoid-mediated effects on hyperalgesic processing, 564–65
 behavior, 564–65
 cellular actions, 564–65
 Spinal prostanoids release of, 564
 Spironolactone, 4
 SPLA₂, 557
 Squash virus-resistant, 100
 SR12813, 6–8
 St. John's wort, 15
 Stability of S-nitrosothiols, 587–89
 Standard Product Nomenclature, 122
Staphylococci, 381
Staphylococcus aureus, 393
 methicillin-resistant, 381
 STAT-6 inhibition of, 86
 Steroid and xenobiotic receptor (SXR), 5
 Steroids, 2–3, 567
 Sterol 27-hydroxylase (CYP27), 11
 Stimulus-biased assays, 361–62
 Stimulus-response mechanisms of receptor systems, 370
 STKE
 See Signal transduction knowledge environment
Streptococci, 381
Streptococcus bovis, 394–95
S. faecalis, 528
S. gallolyticus, 394
S. pneumoniae, 394–95
Streptomyces orientalis, 381
S. toyocaensis, 386, 395
 Structural bases
 of cdk2, ATP, and cyclins, 327–28
 of COX inhibition, 62–63
 of pharmacological specificity, 452–54
 Structural topology of NHE1, 528–30
 Structures, 471–76
 of chemokines with known three-dimensional structures and their receptors, 473–74
 of COX inhibitors, 65
 of difluorophosphonate-containing PTP1B inhibitors, 224
 of nonphosphorus small-molecule PTP1B inhibitors, 225
 of NSAIDs and related compounds, 64
 primary, 471–72
 quaternary, 474–76
 secondary, 472
 of small-molecule Cdc25 inhibitors, 227
 of tea polyphenols, 26–28
 tertiary, 473–74
 of vancomycin and teicoplanin, 382
 Substituted-cysteine accessibility method (SCAM), 449–50

- Susceptibility to carcinogenesis
 possible inverse relationship to capacity of maintaining normal patterns of DNA methylation, 509
- SXR
 See Steroid and xenobiotic receptor
- "Synaptic plasticity," 136, 142
- Systematized Nomenclature of Medicine, 120
- T**
- T helper 2 (Th2) cytokines
 inhibition of, 82-87
- Tacrolimus, 81, 92
- TARC
 See Thymus- and activation-dependent chemokine
- Targeted disruption
 of the PXR gene in mice, 10-11
- Targeted serum screening, 106-7
- Taurochenodeoxycholic acid, 3
- TBS
 See Theta-burst stimulation
- TCDD
 See 2,3,7,8-Tetrachlorodibenzo-p-dioxin
- TEA
 See Tetraethylammonium
- Tea catechins
 absorption and biotransformation of, 29-30
- Tea chemistry, 26-28
 structures of tea polyphenols, 26-28
- Teicoplanin, 382, 398
- Teratogenic exposure and the susceptible genotype, 189-92
- Teratogenic potential, 182-83, 195-96
- Tertiary structure, 473-74
- 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD), 188
- 12-*O*-Tetradecanoylphorbol-13-acetate (TPA), 32, 62
- Tetraethylammonium (TEA), 271
- Tetrapentylammonium (TPA), 271
- TF
 See Theaflavins
- TFdiG
 See Theaflavin digallate
- TGF
 See Transforming growth factor
- Th2 selective inhibitors, 81, 87
- Thalidomide, 193-94
- Theaflavin digallate (TFdiG), 43
- Theaflavins (TF), 28, 39, 45
- Thearubigins, 27-28
- Theta-burst stimulation (TBS), 140
- Three-dimensional structural data, 119
- Thymus- and activation-dependent chemokine (TARC), 92
- TM
 See Transmembrane segment
- TPA
 See 12-*O*-Tetradecanoylphorbol-13-acetate;
 Tetrapentylammonium
- Transcription factor cAMP response element
 binding protein (CREB), 148-49
- Transduction
 See Signal transduction
- TRANSFAC, 119
- Transforming growth factor (TGF), 186, 192, 198, 299
- Transgenic models, 11
- Transmembrane domain residues implicated in ligand binding, 440-45
- Transmembrane segments (TMs), 437-67
- Triacetyloleandomycin, 4
- Tumorigenesis
 inhibition in animal models, 32-41
 inhibition in gastrointestinal tract, 38-39
 inhibition of mammary gland, 40
 inhibition of multi-organ, 41
- TUNEL method, 45
- Tyrosine phosphorylation, 209-10
- U**
- Ubiquitin-conjugating (UBC) domains, 262
- UC Santa Cruz browser, 118
- UDP-glucuronosyltransferase, 45
- Unified Medical Language System (UMLS) project, 121-22
- United Nations
 Food & Agriculture Organization, 100
- V**
- Vaccinia viruses (VV), 483
- Valproic acid, 197-99
- Van gene clusters that confer resistance to

- glycopeptide antibiotics, 387
- Van gene expression
 regulation of, 396-97
- VanA, 386-90
- VanB, 391
- VanC, 391-92
- Vancomycin, 381-82, 395
- Vancomycin resistance
 in staphylococci,
 mechanism of, 394
 strategies for overcoming,
 397-400
- Vancomycin resistant
 enterococci (VRE),
 385-86
- VanD, 392
- VanE, 392-93
- VanG, 392-93
- vanH active site
 orientation of, 388
- vanR-vanS two-component
 regulatory system
 mechanism of action, 397
- Varied roles alterations in
 DNA methylation play
 in carcinogenesis,
 513-14
- Vascular endothelial growth
 factor (VEGF), 45-46
- VDAC
 See Voltage dependent
 anion channel
- Veratrum californicum*, 189
- Verbal Declarative Memory
 Test, 168
- Viral chemokine homologues,
 482-83
- Virus-resistant squash and
 papaya, 100
- Vitamins
 fat-soluble, 2, 12
- Voltage dependent anion
 channel (VDAC), 266
- Volume regulatory responses,
 269-70
- VRE
 See Vancomycin resistant
 enterococci
- VV
 See *Vaccinia* viruses
- W**
- WASP activation, 309, 311
- WAVE activation, 309, 311
- WHO
 See World Health
 Organization
- Wild-type human PXR
 (Alb-PXR), 11
- Wisconsin Card Sorting Test,
 168, 171
- WNT pathway
 cadherins regulating
 signaling in, 301
- World Health Organization
 (WHO), 100, 102-4,
 106-9
- Adverse Drug Reaction
 Terminology, 122
- X**
- X-ray crystal structure
 of the PXR LBD, 13-15
- Xenobiotic response elements
 in *CYP3A* genes, 4-5
- Xenobiotic-responsive
 enhancer module
 (XREM), 10
- Xenobiotics
 binding and activating
 PXR, 6-7
 metabolism of, 2-3
- Xenopus laevis*, 366, 528
- Xenopus* orphan nuclear
 receptor-1 (xONR1), 7
- XML
 See eXtensible Markup
 Language
- XREM
 See Xenobiotic-responsive
 enhancer module
- Y**
- Yellow fluorescent protein
 (YFP), 412
- Yotiao
 and NMDA receptor
 function, 247-48



CUMULATIVE INDEXES

CONTRIBUTING AUTHORS, VOLUMES 38-42

- Acosta D Jr, 38:63-96
 Adams JP, 42:135-63
 Allen JW, 39:151-73
 Altman RB, 42:113-33
 Amara SG, 39:431-56
 Ambudkar SV, 39:361-97
 Anders MW, 38:501-37
 Anderson SP, 40:491-518
 Angers S, 42:409-35
 Aschner M, 39:151-73
 Atkinson AJ Jr, 41:347-66
- Bagdassarian CK,
 41:661-90
 Baker RC, 39:127-50
 Bakhle YS, 38:97-120
 Balboa MA, 39:175-89
 Balsinde J, 39:175-89
 Barber DL, 42:527-52
 Barnes PJ, 42:81-98
 Benovic JL, 38:289-319
 Bertaccini E, 41:23-51
 Blackburn TP, 40:319-34
 Blau HM, 40:295-317
 Bode-Böger SM,
 41:79-99
 Böger RH, 41:79-99
 Borges K, 39:221-41
 Borjigin J, 39:53-65
 Bortner CD, 42:259-81
 Botting RM, 38:97-120
 Bouvier M, 42:409-35
 Bradfield CA, 40:519-61
 Branchek TA, 40:319-34
 Brett CM, 38:431-60
 Breyer MD, 41:661-90
 Breyer RM, 41:661-90
 Broder S, 40:97-132
 Brown JH, 40:459-89
- Brunton LL, 41:751-73
 Burgen ASV, 40:1-16
 Burke MD, 41:297-316
- Carlsson A, 41:237-60
 Carlsson ML, 41:237-60
 Chan PLS, 41:625-59
 Changeux J-P, 40:431-58
 Choudhuri S, 39:267-94
 Chun J, 41:507-34
 Cidlowski JA, 42:259-81
 Coles P, 41:175-202
 Collins MD, 39:399-430
 Contos JJA, 41:507-34
 Corringer P-J, 40:431-58
 Corton JC, 40:491-518
 Costa E, 38:321-50
 Costa LG, 38:21-43
 Coyle JT, 42:165-79
- Dalton TP, 39:67-101
 Davila JC, 38:63-96
 Davis KL, 41:203-36
 Deboucq C, 40:193-208
 Defer N, 41:145-74
 de Groat WC,
 41:691-721
 Dekant W, 38:501-37
 Denhardt DT, 41:723-49
 Denker SP, 42:527-52
 Dennis EA, 39:175-89
 De Vries L, 40:235-71
 Dey S, 39:361-97
 Dingleline R, 39:221-41
 Doull J, 41:1-21
 DuBois RN, 42:55-80
- Elenko E, 40:235-71
 Elliott JD, 40:177-91
- Eudy JD, 42:181-208
 Evans WE, 41:101-21
- Farquhar MG, 40:235-71
 Felder CC, 38:179-200
 Fernandez EJ, 42:469-99
 Finnell RH, 42:181-208
 Fischer T, 40:235-71
 Fisher JW, 38:1-20
 Flexner C, 40:651-76
 Fu H, 40:619-49
 Fukushima N, 41:507-34
- Gelineau-van Waes J,
 42:181-208
 Giachelli CM, 41:723-49
 Giacomini KM, 38:431-60
 Gillette JR, 40:19-41
 Glass M, 38:179-200
 Golding BT, 42:325-48
 Goodman JJ, 42:501-25
 Goodwin B, 42:1-23
 Gottesman MM, 39:361-97
 Greenlee WF, 41:297-316
 Griffin RJ, 42:325-48
 Gu Y-Z, 40:519-61
 Guengerich FP, 39:1-17
 Guyton KZ, 41:421-42
- Hammond HK, 39:343-60
 Hanoune J, 41:145-74
 Hardcastle IR, 42:325-48
 Harris RA, 41:23-51
 Heinrich M, 38:539-65
 Hickson ID, 41:367-401
 Hobbs AJ, 39:191-220
 Hoffman AR, 38:45-61
 Hogenesch JB, 40:519-61
 Hogg N, 42:585-600

- Holford NHG, 40:209-34;
41:625-59
Holm-Waters S, 41:237-60
Hook SS, 41:471-505
Hosokawa M, 38:257-88
Houghten RA, 40:273-82
Hrycyna CA, 39:361-97

Insel PA, 39:175-89, 343-60;
41:593-624
Ishii I, 41:507-34
Ito K, 38:461-99
Iwatsubo T, 38:461-99

Javitch JA, 42:437-67
Johnson DG, 39:295-312
Juliano RL, 42:283-323

Kanamitsu S, 38:461-99
Kedzierski RM, 41:851-76
Kenakin T, 42:349-79
Kensler TW, 41:421-42
Kim RB, 41:815-30
Kimmelberg HK, 39:151-73
Kimko HC, 40:209-34
Kitteringham NR, 41:443-70
Klaassen CD, 39:267-94
Klein PS, 41:789-813
Klein TE, 42:113-33
Kliwer SA, 42:1-23
Kobilka BK, 38:351-73
Kramer RE, 39:127-50
Krupnick JG, 38:289-319

Lau SS, 38:229-55
Law P-Y, 40:389-430
Lebedeva I, 41:403-19
Lee HC, 41:317-45
Lee SJ, 41:569-91
Lefer DJ, 40:283-94
Le Novère N, 40:431-58
Lesko LJ, 41:347-66
Li T-K, 41:53-77
Li X, 39:53-65
Lin JH, 41:535-67
Linden J, 41:775-87
Lipton SA, 38:159-77

Liu J, 39:267-94
Liu LF, 41:53-77
Loh HH, 40:389-430
Lolis E, 42:469-99
LoPachin RM, 39:151-73
Lu AYH, 41:535-67

Maliakal P, 42:25-54
Mao GE, 39:399-430
Marcus R, 38:45-61
Marnett LJ, 42:55-80
Martin E, 41:203-36
Masters SC, 40:619-49
McEwen BS, 41:569-91
McLeod HL, 41:101-21
Means AR, 41:471-505
Melchert RB, 38:63-96
Melvin WT, 41:297-316
Meng X, 42:25-54
Metcalf B, 40:193-208
Michel JJ, 42:235-57
Miller RJ, 38:201-27
Moncada S, 39:191-220
Monks TJ, 38:229-55
Monteleone JPR, 40:209-34
Montfort WR, 41:261-95
Murad F, 41:203-36
Murray GI, 41:297-316
Myers SA, 41:661-90
Myers SJ, 39:221-41

Nagata K, 40:159-76
Nakajima Y, 38:461-99
Negishi M, 41:123-43
Nemeroff CB, 41:877-906
Neu J, 42:381-408
Nilsson M, 41:237-60
Norbury CJ, 41:367-401
North RA, 40:563-80

Ohlstein EH, 40:177-91
O'Neill PM, 41:443-70
Ortiz de Montellano BR,
38:539-65
Otterness DM, 39:19-52
Owens MJ, 41:877-906
Ozawa CR, 40:295-317

Park BK, 41:443-70
Pastan I, 39:361-97
Peck CC, 40:209-34
Phiel CJ, 41:789-813
Plaa GL, 40:43-65
Pootoolal J, 42:381-408
Posner GH, 41:421-42
Post SR, 39:343-60
Powis G, 41:261-95
Puga A, 39:67-101
Putney LK, 42:527-52

Ramachandra M, 39:361-97
Ramos KS, 39:243-65
Rana BK, 41:593-624
Redinbo MR, 42:1-23
Rittling SR, 41:723-49
Robles M, 38:539-65
Rodan GA, 38:375-88
Rodriguez E, 38:539-65
Rodriguez RJ, 38:63-96
Rohrer DK, 38:351-73
Rosenquist TH, 42:181-208
Ruffolo RR Jr, 40:177-91

Safe SH, 38:121-58
Sagi SA, 40:459-89
Sah VP, 40:459-89
Salahpour A, 42:409-35
Satoh T, 38:257-88
Scott JD, 42:235-57
Seal RP, 39:431-56
Seasholtz TM, 40:459-89
Sheiner L, 40:67-96
Shertzer HG, 39:67-101
Shi L, 42:437-67
Shiina T, 41:593-624
Shoham M, 41:175-202
Sibley DR, 39:313-41
Snyder SH, 39:53-65
Springer ML, 40:295-317
Starkov AA, 40:353-88
Staubert A, 40:491-518
Steimer J-L, 40:67-96
Stein CA, 41:403-19
Stein CM, 41:815-50
Steinberg SF, 41:751-73

- Stout SC, 41:877-906
Strassburg CP, 40:581-618
Streit WJ, 39:151-73
Subramanian RR, 40:619-49
Sueyoshi T, 41:123-43
Sugiyama Y, 38:461-99
Surprenant A, 40:563-80
Svensson CI, 42:553-83
Sweatt JD, 42:135-63
Szumlanski CL, 39:19-52

Taylor SL, 42:99-112
Tedroff J, 41:237-60
Thibonnier A, 41:175-202
Thibonnier M, 41:175-202
Thummel KE, 38:389-430
Trudell JR, 41:23-51
Tsai G, 42:165-79

Tukey RH, 40:581-618
Turko IV, 41:203-36

Ulrich RG, 40:335-52

Vane JR, 38:97-120
Venter JC, 40:97-132

Walker CL, 39:295-312
Wallace KB, 40:353-88
Waring JF, 40:335-52
Waters N, 41:237-60
Watson RE, 42:501-25
Weiner JA, 41:507-34
Weinshilboum RM,
39:19-52
West JE, 38:539-65
White RE, 40:133-57

Whitlock JP Jr, 39:103-25
Wilkinson GR, 38:389-430
Wong YH, 40:389-430
Wood AJJ, 41:815-50
Wright GD, 42:381-408

Xie H-G, 41:815-50

Yaksh TL, 42:553-83
Yamakura T, 41:23-51
Yamazoe Y, 40:159-76
Yanagisawa M, 41:851-76
Yang CS, 42:25-54
Yoshimura N, 41:691-721

Zhang L, 38:431-60
Zhang Z-Y, 42:209-34
Zheng B, 40:235-71

CHAPTER TITLES, VOLUMES 38-42

Prefatory

PHARMACOLOGY

A Quest for Erythropoietin Over Nine Decades	JW Fisher	38:1-20
Targets of Drug Action	A Burgen	40:1-16
High-Throughput Screening in Drug Metabolism and Pharmacokinetic Support of Drug Discovery	RE White	40:133-57

TOXICOLOGY

Laboratory of Chemical Pharmacology, National Heart, Lung, and Blood Institute, NIH: A Short History	JR Gillette	40:19-41
Chlorinated Methanes and Liver Injury: Highlights of the Past 50 Years	GL Plaa	40:43-65
Central Role of Peroxisome Proliferator-Activated Receptors in the Actions of Peroxisome Proliferators	JC Corton, SP Anderson, A Stauber	40:491-518
Toxicology Comes of Age	J Doull	41:1-21

General Topics in Pharmacology and Toxicology

RECEPTORS

Cannabinoid Receptors and Their Endogenous Agonists	CC Felder, M Glass	38:179-200
Presynaptic Receptors	RJ Miller	38:201-27
From GABAA Receptor Diversity Emerges A Unified Vision of GABAergic Inhibition	E Costa	38:321-50
Insights from In Vivo Modification of Adrenergic Receptor Gene Expression	DK Rohrer, BK Kobilka	38:351-73
Genetic Regulation of Glutamate Receptor Ion Channels	SJ Myers, R Dingledine, K Borges	39:221-41
New Insights into Dopaminergic Receptor Function Using Antisense and Genetically Altered Animals	DR Sibley	39:313-41
5-HT ₆ Receptors as Emerging Targets for Drug Discovery	TA Branchek, TP Blackburn	40:319-34

Nicotinic Receptors at the Amino Acid Level	P-J Corringer, N Le Novère, J-P Changeux	40:431-58
Pharmacology of Cloned P2X Receptors	RA North, A Surprenant	40:563-80
Lysophospholipid Receptors	N Fukushima, I Ishii, JJ Contos, JA Weiner, J Chun	41:507-34
Genetic Variations and Polymorphisms of G Protein-Coupled Receptors: Functional and Therapeutic Implications	BK Rana, T Shiina, PA Insel	41:593-624
Prostanoid Receptors: Subtypes and Signaling	RM Breyer, CK Bagdassarian, SA Myers, MD Breyer	41:661-90
Role of Osteopontin in Cellular Signaling and Toxicant Injury	DT Denhardt, CM Giachelli, SR Rittling	41:723-49
Molecular Approach to Adenosine Receptors: Receptor-Mediated Mechanisms of Tissue Protection	J Linden	41:775-87
Glutamatergic Mechanisms in Schizophrenia	G Tsai, JT Coyle	42:165-79
Drug Efficacy at G Protein-Coupled Receptors	T Kenakin	42:349-79
Dimerization: An Emerging Concept for G Protein-Coupled Receptor Ontogeny and Function	S Angers, A Salahpour, M Bouvier	42:409-35
The Binding Site of Aminergic G Protein-Coupled Receptors: The Transmembrane Segments and Second Extracellular Loop	L Shi, JA Javitch	42:437-67
RENAL SYSTEM		
Pharmacology of the Lower Urinary Tract	WC de Groat, N Yoshimura	41:691-721
SIGNAL TRANSDUCTION		
Physiological Functions of Cyclic ADP-Ribose and NAADP as Calcium Messengers	HC Lee	41:317-45
Cellular Mechanisms for the Repression of Apoptosis	CD Bortner, JA Cidlowski	42:259-81
SYNAPTIC FUNCTIONS		
Signal Transduction in Environmental Neurotoxicity	LG Costa	38:21-43

Inhibition of Nitric Oxide Synthase as a Potential Therapeutic Target	AJ Hobbs, A Higgs, S Moncada	39:191-220
Redox Regulation of <i>c-Ha-ras</i> and Osteopontin Signaling in Vascular Smooth Muscle Cells: Implications in Chemical Atherogenesis	KS Ramos	39:243-65
Cyclins and Cell Cycle Checkpoints	DG Johnson, CL Walker	39:295-312
The Regulator of G Protein Signaling Family	L De Vries, B Zheng, T Fischer, E Elenko, MG Farquhar	40:235-71
Pharmacology of Selectin Inhibitors in Ischemia/Reperfusion States	DJ Lefer	40:283-94
The Role of Rho in G Protein-Coupled Receptor Signal Transduction	VP Sah, TM Seasholtz, SA Sagi, JH Brown	40:459-89
14-3-3 Proteins: Structure, Function, and Regulations	H Fu, RR Subramanian, SC Masters	40:619-49
Molecular Psychology: Roles for the ERK MAP Kinase Cascade in Memory	JP Adams, JD Sweatt	42:135-63
TRANSPORTERS		
Compartmentation of G Protein-Coupled Signaling Pathways in Cardiac Myocytes	SF Steinberg, LL Brunton LL	41:751-73
AKAP-Mediated Signal Transduction	JJC Michel, JD Scott	42:235-57
The Changing Face of the Na^+/H^+ Exchanger, NHE1: Structure, Regulation, and Cellular Actions	LK Putney, SP Denker, DL Barber	42:527-52
ENZYMES		
The Mammalian Carboxylesterases: From Molecules to Functions	T Satoh, M Hosokawa	38:257-88
The Role of Receptor Kinases and Arrestins in G Protein-Coupled Receptor Regulation	JG Krupnick, JL Benovic	38:289-319
Methylation Pharmacogenetics: Catechol O-Methyltransferase, Thiopurine Methyltransferase, and Histamine N-Methyltransferase	RM Weinshilboum, DM Otterness, CL Szumlanski	39:19-52
Regulation and Inhibition of Phospholipase A_2	J Balsinde, MA Balboa, PA Insel, EA Dennis	39:175-89

Human UDP-Glucuronosyltransferases: Metabolism, Expression, and Disease	RH Tukey, CP Strassburg	40:581-618
Tumor Cell Death Induced by Topoisomerase-Targeting Drugs	T-K Li, LF Liu	41:53-77
Phenobarbital Response Elements of Cytochrome P450 Genes and Nuclear Receptors	T Sueyoshi, M Negishi	41:123-43
Regulation and Role of Adenylyl Cyclase Isoforms	J Hanoune, N Defer	41:145-74
Regulation of CYP3A Gene Transcription by the Pregnane X Receptor	B Goodwin, MR Redinbo, SA Kliewer	42:1-23
Protein Allergenicity Assessment of Foods Produced Through Agricultural Biotechnology	SL Taylor	42:99-112
The Biochemistry and Physiology of S-Nitrosothiols	N Hogg	42:585-600

CHEMICAL AGENTS

The Pharmacology and Toxicology of Polyphenolic-Glutathione Conjugates	TJ Monks, SS Lau	38:229-55
Ethnopharmacology of Mexican Asteraceae (Compositae)	M Heinrich, M Robles, JE West, BR Ortiz de Montellano, E Rodriguez	38:539-65
The Pineal Gland and Melatonin: Molecular and Pharmacologic Regulation	J Borjigin, X Li, SH Snyder	39:53-65
Regulation of Gene Expression by Reactive Oxygen	TP Dalton, HG Shertzer, A Puga	39:67-101
Cytotoxicity of Short-Chain Alcohols Metallothionein: An Intracellular Protein to Protect Against Cadmium Toxicity	RC Baker, RE Kramer	39:127-50
	CD Klaassen, J Liu, S Choudhuri	39:267-94
Teratology of Retinoids	MD Collins, GE Mao	39:399-430
The Clinical Pharmacology of L-Arginine	RH Böger, SM Bode-Böger	41:79-99
The Basic and Clinical Pharmacology of Nonpeptide Vasopressin Receptor Antagonists	M Thibonnier, P Coles, A Thibonnier, M Shoham	41:175-202

Novel Effects of Nitric Oxide	KL Davis, E Martin, IV Turko, F Murad	41:203-36
Inhibition of Carcinogenesis by Tea	CS Yang, P Maliakal, X Meng	42:25-54
PEPTIDES AND PROTEINS		
Protein Allergenicity Assessment of Foods Produced Through Agricultural Biotechnology	SL Taylor	42:99-112
BIOTRANSFORMATION		
In Vitro and In Vivo Drug Interactions Involving Human CYP3A	KE Thummel, GR Wilkinson	38:389-430
Glutathione-Dependent Bioactivation of Haloalkenes	MW Anders, W Dekant	38:501-37
Cytochrome P-450 3A4: Regulation and Role in Drug Metabolism	FP Guengerich	39:1-17
Induction of Cytochrome P4501A1	JP Whitlock Jr.	39:103-25
Metabolism of Fluorine-Containing Drugs	BK Park, NR Kitteringham, PM O'Neill	41:443-70
Interindividual Variability in Inhibition and Induction of Cytochrome P450 Enzymes	JH Lin, AYH Lu	41:535-67
Regulation of CYP3A Gene Transcription by the Pregnane X Receptor	B Goodwin, MR Redinbo, SA Kliewer	42:1-23
NUCLEIC ACIDS		
Cellular Responses to DNA Damage	CJ Norbury, ID Hickson	41:367-401
Ca ²⁺ /CaM-Dependent Kinases: From Activation to Function	SS Hook, AR Means	41:471-505
PHARMACOKINETICS/TOXICOKINETICS		
Role of Organic Cation Transporters in Drug Absorption and Elimination	L Zhang, CM Brett, KM Giacomini	38:431-60
Biochemical, Cellular, and Pharmacological Aspects of the Multidrug Transporter	SV Ambudkar, S Dey, CA Hrycyna, M Ramachandra, I Pastan, MM Gottesman	39:361-97
Mitochondrial Targets of Drug Toxicity	KB Wallace, AA Starkov	40:353-88

CANCER AND CARCINOGENESIS

Interactions Between Hormones and Chemicals in Breast Cancer	SH Safe	38:121-58
Properties and Biological Activities of Thioredoxins	G Powis, WR Montfort	41:261-95
Cancer Chemoprevention Using Natural Vitamin D and Synthetic Analogs	KZ Guyton, TW Kensler, GH Posner	41:421-42
Inhibition of Carcinogenesis by Tea	CS Yang, P Maliakal, X Meng	42:25-54
COX-2: A Target for Colon Cancer Prevention	LJ Marnett, RN DuBois	42:55-80
Glycopeptide Antibiotic Resistance	J Pootoolal, J Neu, GD Wright	42:381-408
Altered DNA Methylation: A Secondary Mechanism Involved in Carcinogenesis	JI Goodman, RE Watson	42:501-25

CLINICAL THERAPEUTICS

Dual Protease Inhibitor Therapy in HIV-Infected Patients: Pharmacologic Rationale and Clinical Benefits	C Flexner	40:651-76
Pharmacogenomics: Unlocking the Human Genome for Better Drug Therapy	HL McLeod, WE Evans	41:101-21
Antisense Oligonucleotides: Promise and Reality	I Lebedeva, CA Stein	41:403-19
Glycopeptide Antibiotic Resistance	J Pootoolal, J Neu, GD Wright	42:381-408

DRUG DEVELOPMENT SCIENCE

Parallel Array and Mixture-Based Synthetic Combinatorial Chemistry: Tools for the Next Millennium	RA Houghten	40:273-82
A Novel Means of Drug Delivery: Myoblast-Mediated Gene Therapy and Regulatable Retroviral Vectors	CR Ozawa, ML Springer, HM Blau	40:295-317
Use of Biomarkers and Surrogate Endpoints in Drug Development and Regulatory Decision Making: Criteria, Validation, Strategies	L Lesko, AJ Atkinson Jr.	41:347-66
Molecular Basis of Environmentally Induced Birth Defects	RH Finnell, J Gelineau-van Waes, JD Eudy, TH Rosenquist	42:181-208

Protein Tyrosine Phosphatases: Structure and Function, Substrate Specificity, and Inhibitor Development	Z-Y Zhang	42:209-34
Designing Inhibitors of Cyclin-Dependent Kinases	IR Hardcastle, BT Golding, RJ Griffin	42:325-48

Systems

IMMUNE SYSTEM/INFLAMMATION

Cyclooxygenases 1 and 2	JR Vane, YS Bakhle, RM Botting	38:97-120
Signal Transduction by Cell Adhesion Receptors and the Cytoskeleton: Functions of Integrins, Cadherins, Selectins, and Immunoglobulin-Superfamily Members	RL Juliano	42:283-323
Structure, Function, and Inhibition of Chemokines	EJ Fernandez, E Lolis	42:469-99

CENTRAL NERVOUS SYSTEM

Glial Cells in Neurotoxicity Development	M Aschner, JW Allen, HK Kimelberg, RM LoPachin, WJ Streit	39:151-73
Excitatory Amino Acid Transporters: A Family in Flux	RP Seal, SG Amara	39:431-56
Molecular Mechanisms and Regulation of Opioid Receptor Signaling	P-Y Law, YH Wong, HH Loh	40:389-430
Anesthetics and Ion Channels: Molecular Models and Sites of Action	T Yamakura, E Bertaccini, JR Trudell, RA Harris	41:23-51
Interactions Between Monoamines, Glutamate, and GABA in Schizophrenia: New Evidence	A Carlsson, N Waters, S Holm-Waters, J Tedroff, M Nilsson, ML Carlsson	41:237-60
Drug Treatment Effects on Disease Progression	P Chan, N Holford	41:625-59
Molecular Targets of Lithium Action	CJ Phiel, PS Klein	41:789-813
Neurokinin1 Receptor Antagonists as Potential Antidepressants	SC Stout, MJ Owens, CB Nemeroff	41:877-906

Glutamatergic Mechanisms in Schizophrenia	G Tsai, JT Coyle	42:165-79
The Spinal Phospholipase-Cyclooxygenase-Prostanoid Cascade in Nociceptive Processing	CI Svensson, TL Yaksh	42:553-83
AUTONOMIC NERVOUS SYSTEM		
β -Adrenergic Receptors and Receptor Signaling in Heart Failure	SR Post, HK Hammond, PA Insel	39:343-60
Genetic Variations and Polymorphisms of G Protein-Coupled Receptors: Functional and Therapeutic Implications	BK Rana, T Shiina, PA Insel	41:593-624
CARDIOVASCULAR SYSTEM		
Endothelin System: The Double-Edged Sword in Health and Disease	RM Kedzierski, M Yanagisawa	41:851-76
ENDOCRINE SYSTEM		
Growth Hormone As Therapy for Older Men and Women	R Marcus, AR Hoffman	38:45-61
Mechanism of Action of Biophosphates	GA Rodan	38:375-88
Neurotrophic and Neuroprotective Actions of Estrogens and Their Therapeutic Implications	SJ Lee, BS McEwen	41:569-91
PULMONARY SYSTEM		
Cytokine Modulators as Novel Therapies for Asthma	PJ Barnes	42:81-98
MICROBIAL SYSTEMS		
Neuronal Injury Associated with HIV-1: Approaches to Treatment	SA Lipton	38:159-77
Miscellaneous		
TECHNIQUES		
Predictive Value of In Vitro Model Systems in Toxicology	JC Davila, RJ Rodriguez, RB Melchert, D Acosta Jr.	38:63-96

Quantitative Prediction of In Vivo Drug Clearance and Drug Interactions from In Vitro Data on Metabolism, and Together with Binding and Transport

K Ito, T Iwatsubo,
S Kanamitsu,
Y Nakajima,
Y Sugiyama 38:461-99

The Impact of Genomics-Based Technologies on Drug Safety Evaluation
Challenges for Biomedical Informatics and Pharmacogenomics

JF Waring, RG Ulrich 40:335-52
RB Altman, TE Klein 42:113-33

ENVIRONMENTAL TOXICITY

The PAS Superfamily: Sensors of Environmental and Developmental Signals

Y-Z Gu, JB Hogenesch, CA Bradford 40:519-61

Pharmacology and Toxicology in the New Millennium

Pharmacokinetic/Pharmacodynamic Modeling in Drug Development

LB Sheiner, J-L Steimer 40:67-96

Sequencing the Entire Genomes of Free-Living Organisms: The Foundation of Pharmacology in the New Millennium

S Broder, JC Venter 40:97-132

High-Throughput Screening in Drug Metabolism and Pharmacokinetic Support of Drug Discovery

RE White 40:133-57

Pharmacogenetics of Sulfotransferase

K Nagata, Y Yamazoe 40:159-76

Drug Discovery in the Next Millennium

EH Ohlstein, 40:177-91

RR Ruffolo Jr.,
JD Elliott

The Impact of Genomics on Drug Discovery
Simulation of Clinical Trials

C Debouck, B Metcalf 40:193-208

NHG Holford, HC Kimko, 40:209-34
JPR Monteleone,
CC Peck

